Evaluation of heritage experiences and the influence of in-situ visual interpretation of non-existent artefacts at St Augustine's Abbey

Ayda Majd Ardekani

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Abstract

Research on heritage experiences approaches the subject from many fields of study, including visitor experiences, interpretation and reconstruction. Despite the multidimensionality of heritage experiences, fewer studies observe it from an integrated interdisciplinary perspective. The emergence of digital technologies and their fast evolution has resulted in frameworks to enhance cultural heritage experiences, specifically by introducing innovative audio and visual interpretation methods.

This research approaches the subject of heritage experiences with specific attention to the collective influence that interpretation methods could have on visitor experiences and making sense of non-existent artefacts digitally presented in-situ among heritage ruins. This research is site-specific to St Augustine's Abbey; an English Heritage site and part of the Canterbury World Heritage Site. The research questions outlined in this research enquire about the contribution of interpretation methods to making sense of a significantly demolished heritage place where only a limited number of artefacts remain on the grounds.

The methodology for this research included: 1) Evaluation of heritage experiences focusing on four core themes, which has been achieved through two stages of qualitative research; and 2) Digital reconstruction workflows, which included selecting non-existent artefacts, digitally reconstructing and presenting them in the form of projections in-situ. The influence of digital reconstruction on heritage experiences and making sense of lost artefacts and the site was examined as part of Stage 2.

The research findings at Stages 1 and 2 demonstrated that presence on the site and having access to audio and visual interpretation of the historic Abbey complement each other and positively contribute to heritage experiences. Participants of this study reported that particular interpretation methods contribute to understanding the historic monastic complex, navigating the ruins and envisioning the scale of the Abbey in the past. This research contributes to learning the advantages of in-situ and digital reconstruction of non-existent artefacts. Further to previously introduced digital frameworks for screen-based visual interpretation of heritage, such as Augmented Reality or device dependent methods such as Virtual Reality, it explores the possibilities and consequences of Spatially Augmenting the space using projections and blending imageries with the site.

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List of Abbreviations

3D	Three Dimensional
ACCORD	Archaeological Community Co-Production of Research Resources
AR	Augmented Reality
ARCHAEOGUIDE	Augmented Reality-based Cultural Heritage On-site Guide
ASEB	Activities Settings Experiences Benefits
CEMEC	Connecting Early Medieval European Collections
CEO	Chief Executive Officer
GAP	Google Arts Project
GPS	Global Positining System
HD	High Definition
HMD	Head Mounted Device
ICCROM	The International Centre for the Study of the Preservation and Restoration of Cultural Property
ICOMOS	International Council on Monuments and Sites
ICT	Information Communication Technology
OUV	Outstanding Universal Value
PEOU	Perceived Ease of Use

PPP Framework	Person Place Process framework
QR	Quick Response code
S1	Stage 1
S2	Stage 2
SAR	Spatial Augmented Reality
SD	Secure Digital
SWOT	Strengths, Weaknesses, Opportunities, Threats
TAM	Technology Acceptance Model
U3A	University for the Third Age
UK	United Kingdom
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
VR	Virtual Reality
WaS	World-as-Support
WebAR	Web-based Augmented Reality
WHS	World Heritage Site
WNEIS	With New Eyes I See
WoW	Window-on-the-World
WWI	World War I
WWII	World War II

Chapter 1: Introduction

1.1 Background

The study of heritage experiences concerns a number of aspects including, where experiences happen, what is involved in shaping experiences, what visitors consume during their visit and what they take away. Examining the correlation between different aspects of heritage experiences shows us how one element contributes to the other and the overall experience. Theoretical perspectives, such as Bal's (1996) exposition theory, reflect on the role of the different elements that contribute to experiences. A stream of studies contextualise experiences based on Dierking and Falk's (1992) Interactive Experience Model (Packer and Ballantyne, 2016), which reflects on the personal, physical and social contexts of experiences. Additionally, a particular field of studies examines experiences through the lens of Pine and Gilmore's (1998) experience economy (Musa et al., 2017), justifying how experiences relate to education, entertainment, escapism and aesthetics.

In the field of cultural heritage, the place where experiences happen is key. Interpretation methods offered during heritage experiences contextualise notions close to a site and its values for visitors. Interpretation today ranges from displays to guided visits (audio-guided and tour guided), re-enactment and digital visual methods. Heritage interpretation informs visitors about narratives, personas, archaeological objects and sites. Interpretive activities also concern the degree of conservation and preservation at heritage sites. Authenticity and integrity of artefacts and sites is another core notion considered in planning and performing interpretive activities.

Heritage interpretation is increasingly adopting technological advancements. In many cases, digital technologies are offered to support visitors' understanding of the past and what could not be interpreted in the physical reality or close interaction. Digital visual modalities of heritage interpretation, such as Augmented Reality (AR) and Virtual Reality (VR), are increasingly employed in digital humanities, specifically for the digital reconstruction of heritage. AR and VR's approaches to interpreting heritage places vary. In the case of VR experiences, 3D modelling of virtual environments, depending on the interaction and imagery qualities, immerse users into a digitally recreated heritage environment. In addition to visualisations, VR heritage experiences could offer interaction with virtual objects, elements and people. On the contrary, AR offers the possibility of augmenting visual media in physical environments. As such, AR also offers digital interpretation physical places.

This thesis further examines heritage experiences at St Augustine's Abbey before and after digital visual interpretations of non-existent artefacts in-situ. In this thesis, the term non-existent refers to artefacts that have either been demolished, fragmented or are no longer available to visitors within the current precincts managed by English Heritage. 'Non-existent' artefact is associated with three groups of artefacts at the Abbey:

1) A Norman nave column which has come down to its foundations. Only ruins of the column base remain in-situ. In this case, non-existent relates to the fact that the column has been demolished and no longer stands in place.

2) A group of excavated medieval tiles that have been re-laid in the Chapel of Our Lady the Angles. The current layout of the tiles at the chapel does not follow a particular pattern. Accordingly, the display does not showcase a full image of the historical patterns and designs. In this case, non-existent refers to the fragmentation of medieval tiles and the lack of the whole of the object.

3) The Piètta graffiti is not available to visitors exploring the site as it is outside the precincts of the Abbey managed by English Heritage. It has also faded significantly and has only a few lines and marks visible. Chapter 3 later discusses the selection of the aforementioned artefacts in detail. In this case, non-existent refers to the lack of

availability to visitors.

The research project introduces digital reconstructions of non-existent artefacts in the form of projections at St Augustine's Abbey and examines the implications of digital interventions on heritage experiences in the context of place. It explores digital heritage interpretation beyond devices and screens. It employs an interdisciplinary approach to evaluate heritage experiences, if and how the in-situ projections contribute to making a better sense of place at a significantly demolished site. It also engages with authenticity from a theoretical point of view and as perceived by visitors to the Abbey. It discusses how digital intervention on the Abbey grounds could impact the authenticity and integrity of the site. It also examines if digitally reconstructed heritage could be perceived as authentic when placed in the material fabric of the site.

1.2 Research questions

Following the themes outlined in the previous section, this thesis centres on evaluating heritage experience and the impact of in-situ visual interpretation of non-existent artefacts. It questions the implications of digitally reconstructing non-existent heritage artefacts and presenting them in the context of place to enhance visitors' understanding and negation of the site, which is significantly demolished. This thesis presents an empirical study at two stages, site-specifically at St Augustine's Abbey, which is a listed English Heritage property and part of the 'Canterbury Cathedral, St Augustine's Abbey and St Martin's Church' World Heritage Site designated in 1988.

The research questions are:

1. How do visitors perceive different experience modalities?

This research question explores heritage experiences sites-specifically at St Augustine's Abbey. It investigates the aspects that influence or contribute to visitors' heritage experiences onsite. It particularly intends to explore how visitors make sense of the heritage place and experience it where the site is demolished, and a significant number of excavated artefacts are displaced.

2. How do different interpretation methods enrich visitor experiences?

This research question explores the contribution of different heritage interpretation methods to visitor experiences. It intends to firstly understand how guided, auditory and visual interpretations are performed at St Augustine's Abbey. Secondly, it investigates how the named interpretation methods individually or collectively contribute to visitors making sense of the historic Abbey. Thirdly, it examines if and how the interpretation methods complement each other to provide a more comprehensive interpretation of the site.

3. How do digital reconstruction and in-situ presentation of non-existent artefacts influence visitor experiences?

Further to examining current interpretation methods in practice on the site, this research investigates how integrating visual interpretation of non-existent artefacts in-situ could influence visitors' negotiation of the individual artefacts and the site as it once stood. This research question specifically explores the context of place and how seeing artefacts where they belong on the site could impact their understanding of the structural and decorative qualities of the site. It also explores digital reconstruction and its presentation in the form of spatial projections as a proposed methodology to revive artefacts in place.

This research question also intends to explore the influence of integrating digital installation in heritage settings on the perceived authenticity and integrity of the site. It aims to understand how visitors negotiate the impact of digital reconstructions in-situ on the heritage site. Could the potential contribution of projections on enhanced making sense of place conflict with how authentic visitors find the site and the visitation experience? Based on Jones' (2009) constructivist approach toward authenticity, it explores visitors' negotiation of authenticity.

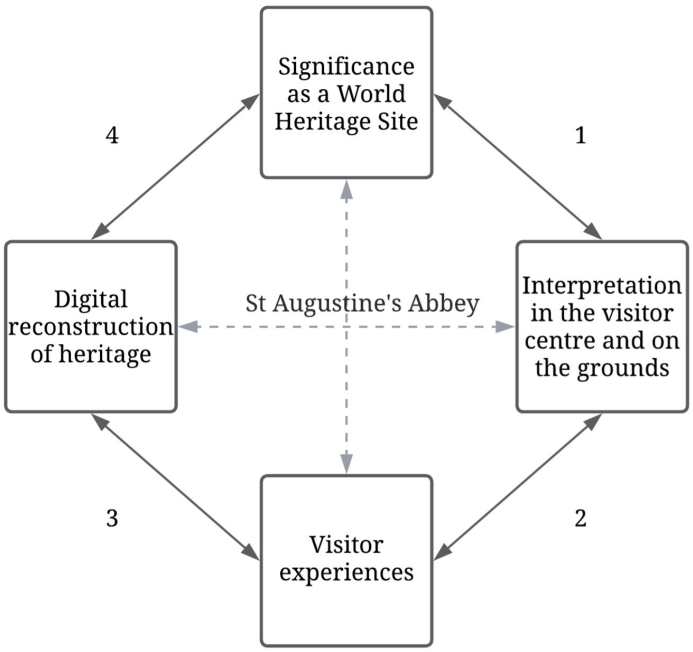
4. In the case of digital reconstructions, what is the border between reality and hyperreality? Where and when one ends, and the other begins?

This research question approaches digital reconstructions from the theoretical point of view of Baudrillard's (1994) realism and hyperrealism. It aims to examine the qualities that visitors associate with the real, representation or simulation of the real and the hyperreal in differentiating the aforementioned terms. It explores the negotiation of

such terms in relation to the projection displays of non-existent artefacts onsite. It also intends to explore whether and how perceived realism of digital reconstructions correlate with authenticity, image quality and visual fatigue of the projections.

1.3 Context of research

This research is site-specific to St Augustine's Abbey and explores narratives intertwined with heritage that contribute to experiences on the site. It engages with narratives affiliated with the site and how they could impact each other. St Augustine's Abbey remains at the centre focus of this research as the heritage place where other elements interact with it. For example, as shown in Figure 1.1, one aspect of the research explores the significance of the site and how it is interpreted on the grounds and in the visitor centre. It also explores the relevance of interpretation methods, particularly visual in-situ approaches such as Spatial Augmented Reality (SAR), on heritage experiences. From a practical perspective, it engages with frameworks on digital reconstruction workflows of non-existent artefacts. Additionally, it explores the potential of in-situ digital reconstruction on visitor experiences and their understanding of artefacts and the site.



1. Identify the focus of interpretive content in presenting the site to visitors
2. Impact of installations on visitor experiences
3. What are the (dis)advantages of interpretation methods?
4. Translating historical data and references into digital counterparts of artefacts

Figure 1.1: Model for context of research

Methodology: This thesis employs an empirical method to evaluate heritage experiences at St Augustine's Abbey. In order to address the research questions outlined in Section 1.2, the experience evaluation took place at two stages. Stage 1 examined heritage experiences offered by English Heritage based on a sample of 65 participants. It analyses a variety of experience modalities, namely guided, self-guided, the use of audio-guide and VR.

Stage 2 examined heritage experiences upon encountering digital reconstruction of non-existent artefacts in the form of projections in-situ. Sixty participants took part in Stage 2, from which 31 also attended Stage 1 and 29 only came to Stage 2. From a practical point of view, Stage 2 experiences involved 3D modelling and texturing of artefacts, as well as arranging projection displays on the Abbey grounds among the archaeological ruins.

The experience evaluation framework designed for this research investigates four themes: 1) Demographic features, 2) Visitor expectations and experiences, 3) Use of technology for heritage experiences and 4) Participant's views on authenticity and realism. The surveys designed for Stages 1 and 2 (appendices C and F, respectively) are primarily qualitative but supported by quantitative data collection methods where appropriate.

Definitions: The primary definitions in this thesis include 'context of place', 'heritage place', and 'visitor centre'. The definition of the terms, in short, is as follows. In this thesis, the 'context of place' is referred to as where heritage experiences occur and where the artefacts once were located. The field of human geography defines and differentiates space and place by defining space as the location and the place as the meaning that people who experience the space associate with it (Tuan, 1979). The term 'heritage place' is associated with sites, built structures or natural environments with cultural significance and values. World Heritage Sites (WHS) refer to heritage places with Outstanding Universal Values (OUV) recognised by UNESCO. This thesis examines heritage experiences at St Augustine's Abbey, which is part of Canterbury World Heritage. The Abbey site includes archaeological grounds as well as a visitor centre. According to Beech (1992), a visitor centre is where artefacts may be held. Its main function is to provide information about the past, present and future of the heritage place with the use of displays and interpretation methods. Chapter 2 further elaborates on the interpretation of the terms in the context of heritage experiences.

Contribution: This thesis's contribution lies in an interdisciplinary approach toward heritage reconstruction and in-situ interpretation of non-existent artefacts. It studies the influence of the context of place and in-situ visualisation of non-existent artefacts on heritage experiences. It further examines the context of place in relation to digital reconstruction and spatial projections, further to the studies on the design and presentation of reconstruction in screen-based AR and VR.

1.4 Thesis outline

The following Chapters in this thesis examine and discuss heritage experiences at St Augustine's Abbey. Chapter 2 presents a literature review based on theoretical frameworks associated with heritage places and experiences wherein. It approaches heritage reconstruction and its impact on heritage experiences from an interdisciplinary perspective. It particularly refers to Virtual Reality (VR), Augmented Reality (AR) and Spatial Augmented Reality (SAR) experiences of non-existent heritage. Furthermore, it discusses where reconstruction stands in relation to the authenticity and integrity of the site and how digital reconstruction could be perceived as auratic and real when experienced in conjuncture with the material fabric of the heritage sites.

Chapter 3 introduces the methodologies employed for this research study. It introduces St Augustine's Abbey as the research site, which includes archaeological grounds and a visitor centre wherein heritage experiences were evaluated. Then, it highlights the significance of the site and its historical timeline, which resulted in the site coming down to its foundations. Later, it discusses the workflows for digital reconstruction and in-situ projection of non-existent Abbey artefacts within the fabric of the site. Consequently, it discusses the empirical approaches toward experience evaluation. Finally, it justifies a primarily qualitative approach for data collection, which is occasionally supported by quantitative statistical data analysis.

The subsequent three chapters present and thematically discuss data gathered at Stages 1 and 2 of the research study. Chapters 4, 5 and 6 respectively observe heritage experiences at the Abbey, the influence of digital implements on experiences and perceived authenticity realism. Chapter 4 begins by introducing the demographic data sets of Stages 1 and 2. Later, it discusses visitor expectations and experiences at Stages 1 and 2. It chiefly presents an ASEB (Activities, Settings, Experiences, Benefits) analysis of the implications of different heritage interpretation methods on experiences within heritage settings. The analysis extends to understanding the contribution of guided, display and visual interpretation methods to making sense of the heritage place and the archaeological ruins

Chapter 5 discusses the implications of digital interpretation methods such as audio-guide, VR at Stage 1, and SAR projections at Stage 2 of this research study. The discussions in this chapter centre on how such audio-visual implements support visitors' understanding and negotiation of the site. This chapter also explains the differences between experiencing lost artefacts of the Abbey in VR and project in-situ as part of Stage 2.

Chapter 6 approaches the digital reconstruction of heritage artefacts and in-situ presentation of them from perceived authenticity and realism theoretical points of view. It discusses visitors' negotiation of the perceived authenticity and realism of projection displays and their impact on the authenticity and integrity of the site. The discussions centre on how well digital reconstruction of artefacts integrate into the material fabric of the site and what basis they could be perceived as authentic or real when experienced in conjuncture with remaining relics onsite.

Chapter 7 presents a conclusion from experience evaluations at Stages 1 and 2. It draws on the research findings and the wider implications of digital interpretation specifically focused on heritage experiences. This chapter demonstrates how an interdisciplinary approach toward digital reconstruction and interpretation of heritage, including creation, implementation and implications, could support experiences. Elaborating on the research findings, it also proposes an experience modality that could enhance heritage experiences at St Augustine's Abbey.

Chapter 2: A literature review

2.1 Introduction

This chapter presents a literature review of the research and practices around visitor experiences at heritage sites. It examines multiple aspects of heritage experiences, including behavioural and experiential practices studying visitor experiences, experience evaluation methods and implications of immersive technologies on heritage experiences. Section 2.2 discusses narratives around experience domains -namely, the roles of the relationship between object displays and viewers in shaping heritage experiences. It introduces theoretical frameworks that justify experience as social and cultural constructs. Additionally, Section 2.2 draws on the importance of probing visitor expectations in understanding visitor experiences.

Section 2.2 also discusses realised heritage experiences. It reviews themes interwoven with heritage experiences. Theoretically, it draws on visitors' social-demographic attributes, including their interests and motivations behind having historical and archaeological experiences, as well as heritage sites' resonance in attracting visitors. The section is followed by reflections on strategies to evaluate experiences in general, particularly within cultural heritage visitations approaches, including psychological and experiential approaches. Furthermore, it discusses the ASEB (Activities, Settings, Experiences, Benefits) grid analysis to evaluate visitor experiences that identify strengths, weaknesses, opportunities, and threats of experiences. It thereby identifies potential opportunities for enhancing experiences through qualitative analysis.

Section 2.3 chiefly observes the role of digital technologies in the context of cultural heritage experiences. It introduces key factors in designing digitally-enhanced experiences in the field of cultural heritage. It also presents digital solutions such as AR, VR, and projections for visual heritage interpretation. Furthermore, it discusses the frameworks and factors for evaluating digital experiences, including the sense of immersion and digital interpretation of history and heritage.

Following discussions of heritage experiences and digital presence of heritage, Section 2.4 presents theoretical definitions of authenticity and arguments around authenticity or inauthenticity of tangible heritage according to the values, context, and notion of the whole object. Conclusively, Section 2.5 respectively employs discussions on authenticity and realism in relation to digital heritage. It presents arguments on the auratic qualities (related to the aura) of digitalised heritage depending on the context they are presented in and perceived. This section also presents arguments on reproducing heritage through digital methods. It then justifies the perceived realism of the precedents of the real through digitalisation.

2.2 Contextualising experiences

2.2.1 Experience domains

In the field of cultural heritage, visitor experiences are observed according to diverse typologies. Each of the typologies reflects on different aspects or modalities of experiences. This section introduces theories that observe experience and elements that shape experiences. Later in Section 2.3 reviews case studies based on the models and theories presented in this section.

Key contributors studying visitor experiences approach the topic by identifying the relationships between aspects that influence experiences. Dierking and Falk's (1992) 'The Interactive Experience Model' observes visitor experiences from visitors' perspectives. It justifies visitor experiences in relation to three contexts: 1) the personal, 2) the social, and 3) the physical contexts. It provides a comprehensive framework on

how visitors perceive experiences in relation to the three aforementioned contexts. The personal context dominates the processes and phases of experiences (pre-, during and post). It also engages with visitor traits, including their interests and motivation for their visits (Section 2.2.2). It also leads to an identity-related model (Falk and Storksdieck, 2005) for understanding experiences based on visitors' motivations and interests which has been applied in visitor typology studies (Almeshari, Dowell, and Nyhan, 2019; Dawson and Jensen, 2011; Hughes, Bond, and Ballantyne, 2013). Observation of the personal context sheds light on the sort of experiences visitors seek, as well as the variety of experiences that fulfil visitors' expectations and leads to a pleasing experience. The personal context aids understanding how the visitors develop their narratives and interpretations around the experience. On the other hand, the physical context is associated with the museum environment, from the exposition space to any object or artefact placed within that environment. It concerns the impact of design and the orientation of the physical settings on visitors learning processes. The importance of the physical context lies in the fact that it guides the visitor to move within the physical environment and where, how and what to see. In this model, the three contexts (the personal, the socio-cultural and the physical) are integrated and collectively contribute to shaping visitor experiences. Therefore, 'The Interactive Experience Model' facilitates observing experiences by looking at the intersection of the three contexts.

Whilst Dierking and Falk's (1992) 'The Interactive Experience Model' observes contexts that govern visitor experience, other frameworks such as Bal's (1996) exposition theory and Leach's (2007) explanation of experience domains address elements that impact experience, including the role of the viewer in interpreting the displays and shaping experiences. Bal's (1996) exposition theory includes three core personas. In this framework, the exposer, the institution that presents, acts as the first person. It informs the visitor (the second person) about the objects on display (the third person). Bal (1996) indicates that the exposer is only one aspect of the experience. It facilitates the experience by providing information about their display content to the visitor, viewer or reader, depending on the context of experience. The role of the visitor (or the viewer or reader) in interpreting the displays becomes prominent in the visitation experience. Bal claims that the on-display object is a sign for which a statement is

required to be narrated. Narration is shaped through presenting or exposing an object whilst providing information about it to construct a connection between the present state of the object with its history: of making, function and meaning. Hence, in order to gain a holistic view of experiences, one needs to identify and explore the relationship between different contributors to the experience.

Leach (2007), however, explains the relationship and roles of the viewer and object in museums differently. In Leach's theory, instead of the primary roles that Bal identifies in the exposition theory, the focus is on the domains, the physical and virtual places where the viewer interacts with the objects. Thus, an emerging theory is constructed based on the physical and virtual domains that the viewer experiences in a museum. The domains namely are the origin, the creation, the display, and the experiencer-object domains. This domain reflects on the particular interaction between the viewer and the object created in a particular time and space, which lasts as long as the viewer engages with the object. It involves the process that the visitor goes through during the visit that inform and shape experiences including meaning making. Consequently, Leach's explanation emphasises the importance of understanding domains that play a role in how visitors' experiences shape in relation to displays.

On a different note, the 'object knowledge' theory (Wood and Latham, 2009) considers the object on display as the primary element and discusses how objects are perceived in museums through different paradigms. However, similar to the theories mentioned earlier, object knowledge also indicates that visitors perceive objects through a connected network of vantage points, including interpretation, the object itself and the referent. Thus, the object becomes the primary component requiring interpretation from material, cultural and personal paradigms. The three paradigms contribute to the concept of 'object knowledge' individually but also need to be considered collectively to ground concept of 'object knowledge'. The cultural paradigm includes the meaning that the viewer associates with an object. The personal paradigm denotes viewers personal narratives, experiences, or relationships with the object.

The theoretical frameworks presented in this section provide the grounds for evaluating visitor experiences. The aforementioned theoretical frameworks are used in Chapters

4, 5 and 6 to evaluate visitor experiences at St Augustine's Abbey. The frameworks are adopted to specifically observe heritage experiences on St Augustine's Abbey grounds and at the Abbey's visitor centre. In Chapters 4 and 5, Dierking and Falk (1992) 'The Interactive Experience Model' is used to understand how St Augustine's Abbey visitors contextualise their experiences from the personal and physical contexts. In this model, personal context is used to understand visitors' motivation for visiting different experience modalities. It draws on what visitors on self-guided or guided tour visits expect to learn during their visit and how much and by what means the experience provides them with information to develop their knowledge about the site. The physical context is employed to understand the influence of intervening the site with digital installations and alternating the physical context on visitors' perception of the site and experience consumption. It is further employed to examine how much intervention in a physical setting influences visitors' perception of the heritage site. Additionally, what are the implications of an alternative physical setting on acquiring information differently?

With respect to Bal's (1996) theory of exposition, in this research context, St Augustine's Abbey is the exposer as it facilitates experience modalities. It introduces the site and its history to visitors (second person) through a display of artefacts and digital reconstruction presented at Stage 2 of the study. Chapter 6 employs Bal's (1996) framework to justify the interrelated roles of the exposition agents in how visitors perceived authenticity and realism.

The three notions on the relationship between the place of exposition, exhibits and visitors are continuously in discourse in Chapters 4, 5 and 6. Chapter 5 explicitly evaluates the impact of display arrangements and interpretation methods at St Augustine's Abbey through which exposition of historical and archaeological artefacts is presented. Objects on display are evaluated from visitors' perspectives to understand the contribution of artefact selection and presentation at the Abbey site. The role of visitors is evaluated to examine how they make connections with and perceive the exposer and the objects. Additionally, the experiencer-object domain in Leach's theory contributes towards making sense of how visitors to the Abbey see the artefacts and the digital reconstruction; how do they interpret them?

2.2.2 Visitor expectations in probing experiences

A shift in evaluating visitor experiences in the field of cultural heritage has meant that research approaches the topic from visitors' perspectives. Masberg and Silverman (1996) emphasised the surge to shift from quantitative evaluation of visitor experiences to qualitative methods that reflect visitors' perspectives on experiences, the terms, and meanings associated with it. Since then, visitor experiences in cultural heritage have been studied in relation to a number of subjects affecting visitor experiences including site management (Moscardo, 1996), heritage consumption behaviour (Di Pietro et al., 2015), balanced use of heritage site in relation to preservation and conservation of cultural heritage, and protecting heritage sites while receiving visitors (Carter and Grimwade, 1997; Parga-Dans, González, and Enríquez, 2020; Weber et al., 2019).

In general, visitor experiences are theatrically observed from psychographic (Hood, 1983) and experiential (Dierking and Falk, 1992) points of view. The psychographic notion emphasises the characteristics of the visitors, particularly their interests, expectations, and satisfaction. The latter recognises visitor experiences as a dynamic and interactive process not limited to the experience itself but also influenced by experiences before and after the visit. In the Dierking and Falk (1992) model, inquiring about visitor expectations before the experience helps evaluate and better understand the visitor experience process.

Thus, as Lee and Smith (2015) state, particularly in heritage and museum environments, obtaining information about experiential features is of noticeable importance for cultural institutions to understand visitor expectations and motivations and consequently offer satisfactory experiences. Accordingly, examining experiences pre-visit reveals visitors' motivations to visit a heritage site, which may also fall into other motivational aspects besides learning about the site itself. McKercher and Du Cros (2003) typology of cultural and heritage tourists suggest that the visitor groups to heritage sites vary depending on their motivational intentions. For example, 'purposeful cultural tourists' have deep cultural experiences and are driven to learn about other cultures. On the contrary, the 'serendipitous cultural tourists' are not primarily cultural tourists but yet have deep experiences. Therefore, the more a visitation experience is dynamic

and offers diverse educational and leisure activities, the more likely it is to fulfil the motivations of broader groups of visitors, resulting in higher satisfaction rates overall. Evaluating visitor expectations are often based on themes that identify visitors' interests and motivations according to the four realms of experience outlined by Pine and Gilmore (1998). The four realms include entertainment, education, aesthetic, and escapism. Case studies such as on World Heritage Site in Hangzhou (Wu and Wall, 2017), motivations and barriers to heritage in Latin America (Ateca-Amestoy, Gorostiaga, and Rossi, 2020), and dark heritage tourism motivations (Ivanova and Light, 2018) investigate visitor expectation and motivational factors for heritage visits within the four realms of experience.

For instance, Sheng and Chen (2012) measured visitor expectations attending four museums in Taiwan, including the National Palace Museum in Tapei that houses historical relics. In this study, they examine several factors in relation to the educational and entertainment aspects of a visit, including historical reminiscence. Based on more than 400 surveys gathered through systematic sampling, they argue that visitors expect fun, easiness and historical reminiscence. They justify this fact by explaining that in modern museums, where the exhibition displays create historical reminiscence, the developments allow processes that meet visitors' expectations of fun and easiness.

Furthermore, a case study on tourists' motivational and emotional involvement at five museums across Jordan conducted by Allan and Altal (2016) further investigates the relationship between visitors' motivations and emotional involvement. Based on over 200 samples gathered from national and international visitors' extensive demographics, they argue that a sense of pleasure is a highly influential emotional factor. Case studies as such approach visitor expectations from psychological aspects of the experience and justify visitor motivations according to already established thematic guidelines within the experience realms. The concluding remarks are of great importance for cultural institutions from an economic point of view. Large-scale data analysis in this context enables institutions to learn about the different activities and experiences that visitors anticipate gaining from a visitation which thus helps institutions attract visitors.

Therefore, visitor expectations require further empirical observations to reflect expe-

riences. Additionally, studies do not adequately reflect on the relationship between intentions of visiting a heritage site, expectations from the visit and heritage consumption. For instance, educative and informative heritage visits govern many visitor motivations and expectations. However, many other statements expressed by visitors first-hand that fit within the broad classifications enable institutions to provide tailored experiences. This thesis investigates visitors' intentions and expectations of visiting St Augustine's Abbey to obtain a clear understanding of what different social demographic groups of visitors to the site expect of their visit in different environmental settings. At Stage 1 (conventional experiences), probing visitor expectations gathered preliminary data to understand what visitors expect to be offered from English Heritage to support their heritage experiences, whether self-guided or guided, (not) using audio-visual interpretation methods. At Stage 2 of the study when Spatial Augmented Reality (SAR) projections were installed on the Abbey grounds, probing expectation helped understanding what visitors envision from digitally transforming the site and its consequences on the contexts of the experience. Data gathered on visitors' expectations, and the comparison between expectations and experiences at St Augustine's Abbey supports understanding what visitors seek and how alternative experience modalities could enhance experiences. Chapters 4, 5 and 6 evaluate experiences at Stages 1 and 2. Ultimately, Chapter 7, based on the analysis proposes an experience modality originating from visitors' reflections.

2.2.3 Heritage experiences

2.2.3.1 Place and making sense of it in heritage context

This section discusses 'place' and making sense of it in the heritage context; two notions that are key in this research and are further discussed in relation to how interpretation methods support making sense of the Abbey. This section begins with defining 'place' and continues to discuss how sense of place is perceived and negotiated in relation to heritage. In future chapters, making sense of place is evaluated at St Augustine's Abbey, reflecting on how audio and visual interpretation methods could support visitors understanding of the site and make sense of the monastic complex before its dissolution.

'Place' and 'space' are two core terms in the field of human geography. Tuan (1979) explains that space is an abstract notion whereas place embodies people's experiences and aspirations in space. Place requires to be explored understood from the viewpoint of people who have given it meaning and continue to do so as they experience it. Accordingly, 'sense of place' (Tuan, 1979) relates to how human beings are bound to spatial settings with particular meanings. Sense of place has become a comprehensive tool to understand place through the relation between people and spatial settings (Shamai and Qazrin, 1991). Respectively, according to Cantrill (1998), people-place bonding lies in human interpretation of places. It is not intrinsic in the physical qualities of the place. Relph (1976) argues that understanding the notion of people-place bonding helps firstly describing the uniqueness of place, and secondly discovering how to improve places that require either to be repaired or restored.

The notion of 'sense of place' has been explored in two streams in psychological, geographical, environmental, architecture and planning studies. One connotation of the term refers to place attachment (Jorgensen and Stedman, 2001), which relates to the meanings that a person or a group of people attach to a place. The other approach toward sense of place is justified in the field of the study of the place such as defining the physical aspects and the characteristics of the environment and also the subjective perspectives of place, particularly in the fields of human geography, and anthropology. Nevertheless, as Graham, Mason, and Newman (2009), place could not be defined until people construct a meaning through using it and understanding the place.

However, several studies demonstrate that sense of place could be defined beyond the aforementioned definitions. Dameria et al. (2020) argue that, sense of place is a multidimensional construct. From a theoretical point of view, sense of place has been observed in models that include several dimensions and refers to many variations of the concept of sense of place - including place identity, attachment, dependence, familiarity and rootedness (Hammitt, Kyle, and Oh, 2009).

In the field of cultural heritage, sense of place has been explored in relation to the continuity of heritage and how it is portrayed through heritage experiences. Tan et al. (2018) and Goussous and Al-Hammadi (2018) explore the sense of place in heritage.

Tan et al. (2018) explore place attachment in relation to the sustainability of intangible cultural heritage at the Malaka and George Town World Heritage Site. Malaka and George Town were international ports and have been influenced by Asia and Europe. Tan et al.'s (2018) study at Malaka and George Town demonstrates that 'Sense of Loss', 'Sense of Justice' and 'Sense of Mission' are the three main sub-themes of sense of place. Sense of Loss refers to people's feeling of losing something. In this case, 'Sense of Loss' relates to the cultural traditions that are less practised or not practised. 'Sense of Mission' resonates with 'Sense of Loss' and reflects on one's judgment and knowing things should be different from how they are. 'Sense of Loss' and 'Sense of Justice' together evoke a 'Sense of Mission' for a person to take action to preserve cultural heritage. 'Sense of Mission' highly relates to the local communities of heritage sites. Tan et al.'s (2018) study demonstrates that knowing the place is key in making sense of the heritage place.

Scannell and Gifford (2010) explain the importance of the characteristics of place in understanding sense of place. They proposed a three-dimensional model for examining sense of place. The framework, PPP, has three antecedents: 1) Person, including individuals or groups who attach a meaning to a place; 2) Place, including both social and physical environments considering the nature, characteristics, and prominence of the place, and 3) Process, which could involve cognitive, affective, and conative components.

In heritage context, both tangible and intangible values associated with places could influence making sense of place. Stedman (2003) argues that physical settings could be predictors of the meaning of place. However, where sense of the place is observed as a social construct, use of physical settings in sense of place could be problematic.

The following part of this section argues how visiting heritage sites at night impacts making sense of place. Germain (2016) argues that in order to investigate experiences at night, different aspects that affect the experience should be considered. Night-time itself affects the mental and physical perception of the surrounding environment leading to different streams of meaning-making of place in the dark.

In tourism, night and nocturnal activities have gained increased importance in offering

experiences beyond daylight. Building up on making sense of place and by referring to it from the perspective of night, tourism has established practices in different genres, including enchanted events and spiritual origins that reflect on how one could seek meaning and make sense of place at night. Edensor and Sumartojo (2017) explores the effects of light on defamiliarising places, whereby projection art attracts attention to often overlooked qualities of places. It is through this process, as Edensor and Sumartojo (2017) argues, that place could be apprehended differently.

Hereby, the relationship between sacred places and the quest for authenticity is discussed. As Chevrier (2019) argues, approaches to nocturnal activities mainly concern entertainment. Although, the other dimension of visiting sacred places at night which stands out is the relationship between the experience and emotions and feelings that are revoked at night and contribute to one's making sense of place in the dark. Light and darkness, a necessary combination for successful nocturnal events, become the core of how places are transformed and experienced. Edensor and Lorimer (2015) reflects on light and darkness through the sense of creativity and art, arguing that particular uses of light could transform the audiences from the present to a newly defined time and space under the influence of light.

What remains in question is how visitors perceive the transformed spaces. The meanings associated with the place at night arguably are different from daytime visits. Visiting sacred places such as St Augustine's Abbey, the meanings and authenticity of the experience are debatable, considering the night-time ambience. Chevrier (2019) explains authenticity by exemplifying Fêtes des Lumière and argues that when nocturnal events happen based on sacred meaning and don't meet the theological motives of visitors, authenticity is not prominent. However, once sacred places such as churches and spiritual meanings are marked, the quest for authenticity is addressed. Therefore, referencing the place and elaborating on its spiritual dimension contribute to how visitors perceive it at night.

This research investigates how visitors make sense of the Abbey as part of their visitation experiences at Stages 1 and 2. It explores how interpretation methods at Stage 1 support making sense of the historic Abbey when exploring the archaeological ruins. At

Stage 2, it explores how reconstructed non-existent artefacts and their consequences on the Abbey settings impact making sense of place. The analysis of experiences Chapters 4 and 5 continue discussing sense of place at St Augustine's Abbey.

2.2.3.2 Conventional experiences

As the previous section discussed, making sense of a place could vary depending on how one negotiates it. Therefore, assessing experiences requires observation from assessing experience requires observation from the personal, the social and the physical aspects (Dierking and Falk, 1992) that shape and influence the experience. Therefore, observation of visitor experiences is fundamental as it sheds light on many factors that visitors find key in experiences. Packer and Ballantyne (2016) have developed a conceptual model based on Dierking and Falk's model of pre-, during and after the visit. The model includes the antecedents and consequents of visitor experiences, including management, external and internal factors of experiences and, ultimately, takeaway impressions.

In addition, visitor experiences are often explored through the lens of the four realms of experience introduced by Pine and Gilmore (1998) in the Experience Economy theory. The four realms (entertainment, education, aesthetic, and escapism) have been explored in the context of heritage experiences. Hayes and MacLeod (2007) employed the four realms to develop heritage experience trails in urban cultural landscapes. Suntikul and Jachna (2016) employ the realms to profile heritage experiences in the historic centre of Macao. Additionally, Saxe (2009) studies entertainment aspects in heritage experiences. Daniela and Aierken (2020) particularly investigate the educational aspect of VR heritage experiences. Kokko and Dillon (2011) observe education in heritage experience in relation to crafts.

As the literature suggests, the four realms of experience by Pine and Gilmore (1998) are applicable to heritage experiences. However, it may differ depending on the diversity of experience offerings and thus be applied to better understand visitor experiences (Musa et al., 2017). The four realms were qualitatively tested in a case study at Batu Caves, Malaysia – a site of temples and shrines offering spiritual, cultural, and natural

experiences. Their results show that all four realms apply to the visitor experiences in this site. However, escapism and education dimensions are most prominent compared to ecstatic and entertainment. Content analysis of this visitor experience survey has shown that cultural escapism is significant among visitors who observe cultural artefacts and decorative arts to comprehend narratives - in this case, sacred tales of Hinduism. The cultural escapism dimension of experience immerses the visitor.

Even though the four realms theory embraces experience dimensions, it does not deeply reflect the associations between visitors and the attraction. Daengbuppha, Hemmington, and Wilkes (2006) developed the model based on visitor experiences at three World Heritage Sites in Thailand, which unravels an approach for conceptualising experiences by looking into more complex constructs influencing experiences. It classifies attractions to understand why visitation experiences take place. The classification results from the qualitative analysis on sensemaking and perception of visitors, experiences and interaction with heritage sites, influential factors on experiences and their influences and, ultimately, how visitors shape their own experiences.

Additionally, a different stream of studies elaborates on why visitation experiences happen by referring to the importance and significance of heritage sites. A significant number of conventional heritage experiences take place at designated World Heritage Sites (WHS) globally. As Poria, Reichel, and Cohen (2013) argue, WHS designation affects experience at these sites as designation validates the significance of the heritage site and objectively authenticates the artefacts presented on the site. Furthermore, the two notions of culture and significance to humans are extensively identified by visitors for WHS designation. The two themes of culture and significance are also reflected in a visitor experience study at Cambodia's Angkor Wat (WHS) (Baniya, Dogru-Dastan, and Thapa, 2020). Experience analysis at this archaeological site based on over 30,000 user-generated online reviews over four years suggest that more than 80% of the visiting population had positive sentiments of visiting the site. On the topic of World Heritage Site, terms such as 'world', 'history', 'place/site', and 'amazing' were included in the positive expressions reflecting on cultural values visitors associate with WHS. Therefore, literature focusing on experiences at World Heritage Sites facilitates understanding visitors' perception of the values and cultural significances of sites, as

well as the importance of communicating these through interpretation.

According to Uzzell (1996), one focal pillar of heritage interpretation is to enhance the sense of place and the identity of the place for visitors. Similarly, Stewart et al. (1998) explain that interpretation intends to stimulate and elaborate people's understanding of the place, and by doing so, interpretation can further the development of empathy for the conservation of cultural heritage. Uzzell (1996) stated that at the time, a limited number of discussions on interpretations benefited from a theoretical point of view. Uzzell (1996) argued that notions such as how people construct the past and how heritage could influence people's control of time and place were not examined enough. Two decades later, Selby (2016) argues that heritage interpretation now is practised through visualisation, representing, and performing. However, often heritage interpretation is inclined toward staged authenticity and commodification. Selby (2016) explains heritage interpretation as semiotics where the signifier conveys a message about the signified. Additionally, discourse is a key part of semiotics. In the heritage context, interpretation is the signifier that rationalises the signified.

The following part of this section explores how existing literature references interpretation as well as how interpretation supports heritage consumption. Stewart et al. (1998) evaluated interpretation for Mount Cook National Park, New Zealand. Their study focused on provisions of interpretation on site, the uses of interpretation for visitors and the relevance between the sense of place and interpretation. The findings demonstrated that people could develop a meaningful sense of place at undifferentiated sites such as Mount Cook as a result of interpretation. In addition, a sense of appreciation of place could also be developed. Appreciation in this context means going beyond developing concerns over the site values by identifying the significance and meanings of the site.

Approaches to Heritage interpretation have evolved over the years. Tilden (2009), for example, explain interpretation as "an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information" (Tilden, 2009, p 17) [first edition published in 1957]. According to Light (1991), in Britain, heritage interpretation was adopted following Tilden's views on the subject and practised

for interpretation of natural environments, built environments, and heritage industry. Lumley (1988) argues that two major shifts have been in heritage interpretation: 1) debates around authenticity and 2) interpretive media, which in recent years has involved technology to a great extent. Visualisation and the visual culture as Staiff (2014) explains contribute towards imagining heritage places, especially for places such the Pyramids of Gaza or the Great Wall of China that are heavily consumed through visual imageries. Imagining places with no or limited imageries could be difficult. However, written descriptions also stimulate mental imagination.

Ireland (2012), based on a study on colonial archaeological sites in Australia and New Zealand observing how archaeological artefacts are perceived and experienced, argues that visitors do not distinguish heritage sites as ruins, abandoned, or (non)indigenous, but consider all as heritage and thus value them. From both an experiential and archaeological point of view, the visitation experience assists visitors in making sense of the site and historical remains, which is core. More importantly, it enables visitors to construct meaning from their observation. Construction of meaning initiates from personal views. Sensemaking of experience also correlates with consumption characteristics and disposition. Guthrie and Anderson (2010) argue that because visitors make sense of experiences in their own ways, there is no universal way to evaluate experiences. However, their analysis of experiences at Edinburgh and Greenwich with heritage attractions indicates that while visitors have many characteristics, they can be classified on a three-point spectrum of 'ideal types' (Weber, 1962) including gourmets, grazers, and gourmands. In general, gourmets are discerning. The quality of experience is more important for gourmets. They opt for fewer but more in-depth experiences compared to gourmands. However, gourmands are prescriptive in terms of wanting to see all that a destination offers. They are also 'experience collectors' and prefer the number of experiences to the quality. Grazers are open to experience freely and easily. They browse free of drivers established by gourmets and gourmands. The spectrum reflects on experience consumption types. The experiences of each group of visitors among the three points of the spectrum vary according to their attitude towards perceiving experiences. For example, as Guthrie and Anderson (2010) state, consumption at heritage destinations varies among different visitor traits.

Additionally, representing and performing heritage interpretation methods contribute to making of a sense place. However, interpretation methods as such also raise concerns about inauthenticity and staged which is further discussed in Section 2.4.

In relation to heritage and experience consumption, Chapter 4 examines visitors' expectations according to the personal context of Dierking and Falk's model. Thus, it identifies visitor groups with different interests and reasons to visit and re-visit the site. Consequently, it reviews heritage experiences' consumption of different visitor groups to understand the relationship between expectations and experience modalities including: 1) What do they like to see? 2) How do they like to observe the site? 3) What is their preferred channel to perceive historical and archaeological information?

2.2.3.3 Night-time experiences

In recent years the tourism industry has increasingly introduced night-time experiences across different sectors, opening the discussion for themes and narratives around night as well as extending daytime experiences into the night. Eldridge and Smith (2019) discuss tourism and night, where they interact and challenge each other. From a tourism point of view, experiences at night have been addressed in relation to many aspects, including but not limited to creative events (Edensor, 2014; Winton, 2016; Zhang, 2019), experience development (Fang and Zheng, 2022), regeneration and the economic contribution of night-time events to the industry (Giordano, Nofre, and Tataranni, 2018; Jiang and Hong, 2021), local communities and visiting communities (Gannon, Taheri, and Croall, 2021).

Previously, section 2.2.3.1 discussed making sense of place and the influence that darkness and nocturnal events could have on visitors. This section reviews particularly associated impacts that night-time events could have on heritage sites and cultural institutions. It explores the associated impacts from the following points of view:
- Attracting visitors to heritage sites at night,
- Introducing experiences at night and their influence on sustainable and balanced visitations.

Night and nocturnal events open the opportunity to engage visitor groups with cultural heritage beyond ordinary daytime visits. Offering new experiences has been at the centre of visitor engagement strategies and developing programmes. It has been regarded as an advantage in addressing visitor groups with interest and motivations for visiting cultural institutions in different physical contexts and providing higher visibility and popularising the institution (Komarac, Ozretić Došen, and Jurić Bulatović, 2019). For many cultural institutions, offering nocturnal events and activities has become a pathway to reach out to specific visitor groups, specifically Generation Y (Barron and Leask, 2017).

However, from a policy and management point of view, event planning and offering night-time experiences require insight into the audience group. Black (2018) refers to the fact that to continuously engage Generation Y as a notable visitor group, cultural institutions should provide programmes matching the generation's lifestyle expectations, which include events and atmosphere. As Black (2018) reports, for Generation Y, sense of belonging in cultural institutions relates to where lifestyle is considered besides engagement with the exhibits. Therefore, by knowing the prospective audience group, careful consideration is required to design experiences that attract and satisfy groups of visitors with particular interests and motivations.

Night-time experiences contribute to the visitor economy in different ways. Extending daytime visits into night-time modalities seeks reflection from the experience development point of view. In the heritage context, it can be argued that, such extension could be an opportunity for offering interpretation beyond daytime through creative and innovative practices such as enchanted events and light shows (Edensor and Lorimer, 2015; Lovell and Griffin, 2022) where the media and medium contribute to transforming place.

Offering night-time experiences is affiliated with advantages and disadvantages, challenges and values. Therefore, certain aspects require consideration to ensure that night-time experiences are advantageous to sites and positively contribute to experiences. Stockman (2018), based on data gathered from numerous cultural institutions, argues that besides audience development, aspects such as capacity and frequency of

night-time events are of significant importance.

Offering night-time experiences have a particular cost which, considering the current economic situation, might not be observed as financially efficient in the short run. However, if night-time experiences are developed for long-term and repetitive occurrences, they can support income generation and the economic sustainability of sites. Today, considering the financial circumstances, many organisations face doubts about if and how long they can perform. Many other sites have either closed or are running at a lesser capacity due to the aftermath of the Covid-19 pandemic (UNESCO, 2021b).

On a different note, developing and promoting night-time experiences could also support overcoming the challenges of high and low visitation rates. High visitation rate is a concern at particular heritage sites. It especially affects communities who live in proximity of heritage sites (Adie, Falk, and Savioli, 2020). In the case of European historic cities, as Garcia (2017) argue, city centres often feel the pressure of high visitation rates. Thus, night-time events at other less visited sites could offer an opportunity to manage crowds and direct visitors to other locations, which facilities enhanced heritage protection (Wang and Bramwell, 2012), a key discourse in sustainable development for highly visited sites, and exposure for less visited sites. Night-time experiences could solve the seasonality (Connell, Page, and Meyer, 2015) of heritage visits, uneven experience offering and demand at heritage sites (Cuccia and Rizzo, 2014).

This research explores the perceived value of introducing a night-time experience at St Augustine's Abbey. It evaluates the impact of visitors making sense of the place as a consequence of visual interpretation at night. The findings presented in Chapters 4 to 6 later discuss the advantages and disadvantages of the night-time experience at the Abbey, focused on digitally interpreting non-existent artefacts. Consequently, the findings contribute to proposing a night-time experience modality at Abbey, leveraging the benefits of daytime and night-time experiences.

2.2.3.4 Empirical approaches towards experience evaluation

Heritage experiences are examined from behavioural and experiential dimensions. Studies focusing on the behavioural attributes predominantly observe visitors' profiles, intentions, and perceived value of heritage experiences. However, experiential case studies evaluate experiences not according to visitors but based on dimensions of the experience that a visitor encounters during a heritage visit. According to Apostolakis (2003), theoretically, heritage is observed either with respect to tangible and intangible cultural heritage, primary and secondary destinations in heritage tourism, or experientially through the consumption of heritage.

In behavioural studies, cluster analysis of visitors has been applied to understand the variety of groups that visitors represent based on their distinctive traits. However, the social demographic attributes of visitors are differently observed. As an example, Ramires, Brandão and Sousa's (2018) case study on the World Heritage City of Porto in Portugal reflects that heterogeneous behaviours are seen among heritage visitors. Therefore, visitors can be categorised into clusters based on the characteristics they present. For example, 'conventional cultural tourists' prefer to visit heritage and monumental sites when selecting destinations. Although clusters identify collective attributes of visitor profiles, they do not engage with the social-demographic attributes of visitor groups in detail. Adie and Hall (2017), based on surveys conducted on three World Heritage Sites, namely Independence Hall in the USA, Studenica monastery in Serbia and Volubilis in Morroco, argue that demographic attributes such as gender diversity and high education levels are visible among visitors to World Heritage Sites.

Empirical studies that evaluate visitor experiences approach the subject by qualitative methods such as employing the ASEB (Activities, Settings, Experiences, Benefits) gridline that examines the strengths, weaknesses, opportunities and threats of activities, settings, experiences, and benefits of experiences (Beeho and Prentice, 1997; Bond, Packer, and Ballantyne, 2015; Pryce, Bhati, and Chaeichi, 2014; Qin et al., 2020; Sun et al., 2021).

The grid line allows qualitative analysis of visitor experiences from a multidimensional

and experiential perspective within a particular context. It sheds light on the strengths and weaknesses of the experiences' domains. Thus, it assists in understanding in what respect experiences can be improved. Visitor experience evaluation at the Ironbridge Gorge Museum (Beeho and Prentice, 1995), a socio-industrial heritage site in the UK, is a very comprehensive example of employing the ASEB grid in visitation studies. The case study investigates the positive and negative aspects of factors that individually and collectively impact visitation experiences. A deep qualitative analysis of the experiences, for instance, reveals more in-depth domains associated with the experience, including visitors' interpretation, advantages, and disadvantages of displays or how the museum communicates the information. Upon an effective evaluation of experiences, a greater understanding of opportunities to enhance experiences can be achieved. For example, in the Ironbridge Gorge Museum, experience evaluation led to an understanding of the possibilities of expanding the museum offerings by showcasing a village that simulates the work and life at Blists Hill in addition. While the ASEB grid analysis underlines different aspects of experience at Blists Hill, the reconstruction of the Blists Hill is criticised for inauthenticity and staged authenticity (Ucko, 2000). The debates on Blists Hill draw on the search for authentic experiences (engaging visitors with meaningful play, creativity and visceral engagement with history (Rutherford-Morrison, 2015) as well as comparison with industrial age interpretations in Europe and the US (Leary and Sholes, 2000).

The ASEB grid line, as well as the evaluation of visitor experiences at a particular site, can be employed to compare experiences at different locations or different modalities of experiences. A comparison of experiences using ASEB gridline at three religious sites (Canterbury Cathedral, the Anglican Shrine of Our Lady of Walsingham, Norfolk, and the Glastonbury Abbey) by Bond, Packer, and Ballantyne (2015) has proven that even in sites that offer relatively similar experiences and activities, visitor experiences can differ. Even though the three locations offer a combination of spiritual and interpretive museum experiences, the comparative evaluation indicates that Canterbury Cathedral visitors, for instance, are more interested in visiting the site to see the building and architecture than religious practices. Bond, Packer, and Ballantyne (2015) conclude, grand heritage sites such as Canterbury Cathedral attract visitors who seek cultural

and heritage experiences. Visitors more interested in worship-focused experiences are more attracted to shrines or religious festival sites. Therefore, this study sheds light on the fact that heritage sites as such require expanding their resources to improve visitor experiences in terms of education and culture besides spiritual activities (Hughes, Bond, and Ballantyne, 2013).

This thesis investigates visitor experiences at St Augustine's Abbey in Canterbury, following ASEB gridline analysis. It observes visitation experiences in different physical arrangements at the site where individuals' understanding and interpretation of the Abbey is stimulated with several audio and visual displays. It aims to comprehend which experience modality attracts which group of visitors with different visitation motivations and interests and, consequently, which experience scenario fulfils visitor expectations most effectively. Similar to the aforementioned studies, it looks into visitor profiles to understand which groups of visitors benefit from which experience modality. Further than observing visitor expectations and experiences, it discusses the prospects of digital audio-visual interpretation methods on visitor experiences and their negotiation of the site.

2.3 Technology-enhanced experiences

2.3.1 Digitally enhanced experiences

As aforementioned, discussions on visitor experiences are mainly concentrated on the expectations and perceived experiences of consumers. Perceived quality of experiences, and, consequently, visitors' satisfaction and dissatisfaction are other subjects that can be observed from both experience design and experience evaluation points of view. This section reviews case studies and frameworks to enhance experiences. Later in this chapter Sections 2.3.2 and 2.4.3 discuss experience evaluations methods for conventional and digitally enhanced experiences.

In the context of digitally-enhanced experiences, examining factors such as information, communication and engagement that influence the experience is also of high impor-

tance. The existing literature addresses the implications of digitalisation on heritage interpretation and experiences. For instance, Kempiak et al. (2017) employed a positivistic approach to examine factors within the heritage settings in relation to visitor experiences at six heritage sites in Northern Ireland. Their study analysed the influence of drivers such as information, methods of communicating information, visitor engagement on performances and participatory activities and atmospherics. Kempiak et al. (2017) argue that accuracy and clarity of information provided to visitors is a key influential factor on visitors' experiences. Additionally, communication methods such as interactive exhibits or special event engagements positively contribute to visitor experiences. Similarly, Jewell and Crotts (2009) also indicate that several elements, including interpretation of the site's history, accurately delivered leads to a satisfying visitor experience. Thus, whilst information is a prominent factor in quality experience, methods provided to communicate the information also have noticeable significance.

The use of immersive technologies is growing in the cultural heritage sectors. Heritage sites, museums and other cultural institutions are employing VR to expand the possibilities of showcasing their content virtually or interactively virtually. A key factor measured in VR technologies is how much it enhances the user experience by immersing them in a virtual environment and manipulating users' perception of presence in virtual environments (Pujol-Tost and Economou, 2007). In the cultural heritage context, one aspect of it can be defined as how users find an additional layer of information presented about artefacts, monuments or pieces of artwork engaging and straightforward (Drossis, Birliraki, and Stephanidis, 2018; Guerra, Pinto, and Beato, 2015)

VR technologies are a solution to presenting cultural heritage not accessible for visitation due to loss, conservation and preservation reasons, or undergoing refurbishment. This also extends to simulating the virtual environment or related objects in relation to the original context where such links have completely disappeared. Therefore, the historical virtual environments simulated in VR technologies not only represent imageries of the historical context but also facilitate a sense of presence in the historical context for the user. Recreation of Basilica of Sant'Amborgio, Milan (Banfi, Brumana, and Stanga, 2019) and Cathedral of Palermo (Agnello, Avella, and Agnello, 2019) are recent examples of reviving historical content through immersive virtual reality. As

Younes et al. (2017) mention, technologies create a bridge between people and cultural institutions. Technology is a facilitator where experiences can be enhanced, and the audience can learn about culture more effectively.

The emergence of technology in sectors such as culture is not limited to entirely virtual environments. The extent to which virtual and real existence merge results in other forms of environments such as augmented or mixed realities. Pujol-Tost and Economou (2007) argue that in cultural heritage, similarities and differences between virtual, augmented, and mixed realities lie in three factors. Firstly, the contextual relationship that shapes between the viewer and the virtual object and the cultural heritage sector. Secondly, there is the collaboration which is facilitated between the users of VR. Thirdly, engagement between visitor and virtual object as well as visitor with the virtual environment. Mixed-Reality features a digital interaction model where the user can benefit from an overlay of digital content in the physical space. As Younes et al. (2017) mention, a prominent use of Mixed Reality in cultural heritage is merging 3D reconstructions of heritage with their natural environments to facilitate a contextual link between the virtual object and the environment.

The frameworks suggest that incorporating digital technologies at heritage sites can enhance experiences through expanded interpretation and dissemination of information digitally. Chapter 5 discusses digital implements at St Augustine' Abbey as part of the experiences that English Heritage offers (conventional experiences) and also exclusive events where projections were installed on site. Based on the discussions in this section, Chapter 5 evaluates how particular audio-visual implements (audio-guides, Virtual Reality and Spatial Augmented Reality) influence visitor experiences at the Abbey. Analysis from evaluating the impact of the audio-visual implements is then used in Chapter 7 to introduce a site-specific framework to enhance experiences and interpretation of heritage at St Augustine's Abbey.

2.3.2 VR, AR and Spatial AR assisted heritage experiences

Virtual, Mixed, and Augmented Reality technologies are increasingly implemented in the cultural heritage sector. Such technologies are adapted in preservation (Aggour,

2017; Aziz and Siang, 2014; Selmanović et al., 2020; Zhong, Wang, and Zhang, 2021) and conservation, restoration, and presenting the past and have been studied from the learning context, experience modalities and user experiences (Rahaman, 2018). Although not equivalent to reality, VR technology can be employed for visually reconstructing historical eras, providing that archaeological references and knowledge of that particular time are available (Ch'Ng et al., 2020). Through this process, such technologies assist in preserving cultural heritage at the risk of vanishing (Pescarin, 2009). According to the 'Charter on the Preservation of the Digital Heritage' not only are digital reconstructions of heritage of great value, but they are also commonly acknowledged as heritage and require preservation (UNESCO, 2009).

Despite the evolving role of technology in cultural heritage, some cultural institutions still enact historical scenes with physical objects, which results in visitors' lack of experiential engagement with cultural heritage because interaction between objects and viewers is limited. Therefore, in such circumstances, learning does not occur through personal experiential channels. Lee, Jung, et al. (2020) indicate that absorptive experiences (education, and entertainment-focused) influence immersion. Mortara and Catalano's (2018) analysis of VR and AR systems on learning experiences in cultural heritage suggests that factors such as immersion, presence and interactivity embedded in virtual heritage environments trigger a cognitive impact on users and are "determinants of interest in learning" (Mortara and Catalano, 2018, p 18). This is due to the fact that the multidimensional virtual objects and environments, depending on the quality of the embedded system, could imply a sense of immersion not distinguishable from reality. In cases where heritage artefacts are preserved, the recreation of their original context is also of significance. As Mortara and Catalano (2018) exemplify, observing a single column housed in a museum is not identical to viewing a line of the columns digitally recreated from ancient Greek. However, besides creating 3D environments, other factors such as signs of life in the historical era create a more realistic, hence tangible, experience of the past.

This section discusses the thematic concepts in which VR in heritage and museums, among which restoration of heritage in a virtual environment is a very prominent example. The development of VR and AR technologies site-specifically designed for the

Roman Theatre at Byblos, an archaeological ruin (Younes et al., 2017) (Figure 2.1), employs technology to facilitate better appreciation and visualisation of non-existent historical structures (Figure 2.2) for viewers where individual observation of the site on its own does not serve the purpose of interpreting the historical structure a great deal. In this case, the solutions serve to better feature historical purposes and appearances of archaeological and historical sites (Hughes, Bond, and Ballantyne, 2013). It concentrates on visualisation and embedding interactions and navigation methods systems.

The example at Byblos leads into two streams of discussion; technological developments and their impact on digital heritage experiences. With respect to technology, Hassenzahl (2003) developed a model for user experience which elaborates on product features (content, presentation, functionality, and interaction), product character and consequences. Han, Dieck, and Jung (2018) employed Hassenzahl's (2003) user experience model for AR in urban heritage in Dublin, Ireland. They adapted the model for AR in urban heritage, identifying sub-factor features such as navigation in AR, accurate GPS-based AR, according to Hassenzahl's (2003) model. Pagano, Pietroni, and Poli (2016) further investigate human computer interactions in the Virtual Museum of the Tiber Valley – virtual content in a real museum space with respect to (non)instrumental system qualities and emotional user experiences.

Figure 2.1: Byblos Roman Theatre in its current state (Younes et al. 2017)

Figure 2.2: The hypothesized model added and aligned on top the computerized model of the theatre (Younes et al. 2017)

In digital cultural heritage experiences, technological developments, including interface design and embedded interaction, correlate with the extent to which users feel presence in the digitally created or enhanced environment. Champion (2006) refers to the cultural presence in relation to virtual technologies as the feeling of creating culturally meaningful environments. Pujol and Champion (2012) argue that cultural presence results from a combination of the feeling of 'being there' and the communication and social aspects of heritage. Correspondingly, a case on the Neolithic site of Çatalhöyük in Turkey (World Heritage Site) by Pujol-Tost (2019) demonstrated that experiential characteristics and communication channels of VR constitute virtual mediated experiences. Different conditions embedded in a VR reconstruction of the site, structures, environment with objects, environment and inclusion of characters, VR with soundscapes and text and voice off talking, resulted in different levels of cultural presence. For example, VR condition of architectural structure conveyed a sense of place. However, due to lack of engagement and emotional connection with the user, it was identified as least suitable. Digital recreations of cultural heritage focus extensively on precision of historical buildings. Therefore, aspects such as historical human lives and cultural rituals are less addressed. Abdelmonem et al. (2017) argue that social-spatial dimensions of everyday life yet lacks in digital reconstruction of cultural heritage. They base their argument on the digital reconstructions of Middle Eastern heritage, namely the Egyptian History interface so-called CULTURAMA where it yet lacks integration of everyday practices.

The displays offered in Ename museum, Belgium, are another example of employing virtual realities in this context (Pujol-Tost and Economou, 2007). The Ename Museum acts as the interpretation centre of St Laurentis Church's architectural monuments and the Ename's abbey archaeological site. The study introduced three different interactive solutions, including VR, to approach the site's history and its remaining relics. The study's evaluation aimed to configure what visitors obtain from the interactive displays, as well as their opinion on characteristics such as usability and engagement of the interactive exhibits in museums. The results showed that the displays aided visitors with learning about the history of the site and filled gaps in the lost archaeology for visitors (Ponsignon, Durrieu, and Bouzdine-Chameeva, 2017).

Immersion in AR and VR technologies intends to make users perceive that they are present in a real world created from non-physicality. This is primarily achieved from visual and soundscapes. However, haptic (Loscos et al., 2004) and olfaction technologies create more tangible environments. Drossis, Birliraki, and Stephanidis (2018) argue that enhancing users' experience in relation to perception and presence is key in VR. The 'AkraeVision Archeo' project by Bozzelli et al. (2019) is another VR display on the Temple of Hera II of Paestum. The VR demonstrated the 3D reconstruction of the temple and provided information about it through three channels, namely environmental, experiential, and educational. The environmental channel is the first exposure of the VR where the user is immersed in a virtual environment different from the place and time that the user lives in. The second, the experiential channel, is constructed by the experience of absorbing information in the virtual environment, interactively participating in the virtual occurrences that one can witness in VR. The third, the educational channel, provides the user with more constructed historical information through embedded text and voice in the virtual environment. Guerra, Pinto, and Beato (2015) refer to the multiple channels as promises of VR for users to find the information they receive straightforward and engaging. Respectively, Vico (2018) argues that a principle of digital heritage models is that it provides the opportunity to interactively explore the content, ultimately facilitating understanding of the bigger picture and integrating the multilevel construct of the information presented.

However, as much as VR advancements aid interpretation of historical and archaeological through headsets, a more blended integration of technology and archaeological sites can offer opportunities and visualisation of the relevant content without physical constraints between the viewer and the actual site. Nofal, Reffat, and Vande Moere (2017) introduced the term 'phygital heritage' to discuss the integration of digital mediums and physical reality for an enhanced offering of cultural heritage. Augmented Reality (AR) contributes towards this aim with respect to conservation, and avoids any obstruction to the site and ordinary visitation experiences (not digitally enhanced). The 'ARCHAEOGUIDE' (Augmented Reality-based Cultural Heritage On-site Guide) (Vlahakis et al., 2001) developed for the archaeological site of Olympia in Greece is an early example of applying mixed realities in the field. The project offered a digital

guide for visitors on site to better appreciate the magnificence of this historical site reconstructed in 3D. Visitors' evaluation of the AR system indicated that younger users, presumably with most proficiency in computer technologies, found the project a digital gamification and leisure experience.

The CEMEC (Connecting Early Medieval European Collections) project (Pietroni et al., 2019) is another example of reviving historical objects and stories through digital technologies with the aim of exhibiting a more comprehensive display of historical artefacts. The project is an example of the integration of digital and physical content where viewers are not immersed in the virtual environment. On the contrary, the virtual displays (holograms) enter the physical world and create the AR environment that manipulates the viewer's perception of, and engagement with, the museum object.

Figure 2.3: Screenshot from holographic showcase of Mytilene Treasure in Athens by Eva Pietroni, https://vimeo.com/285977554

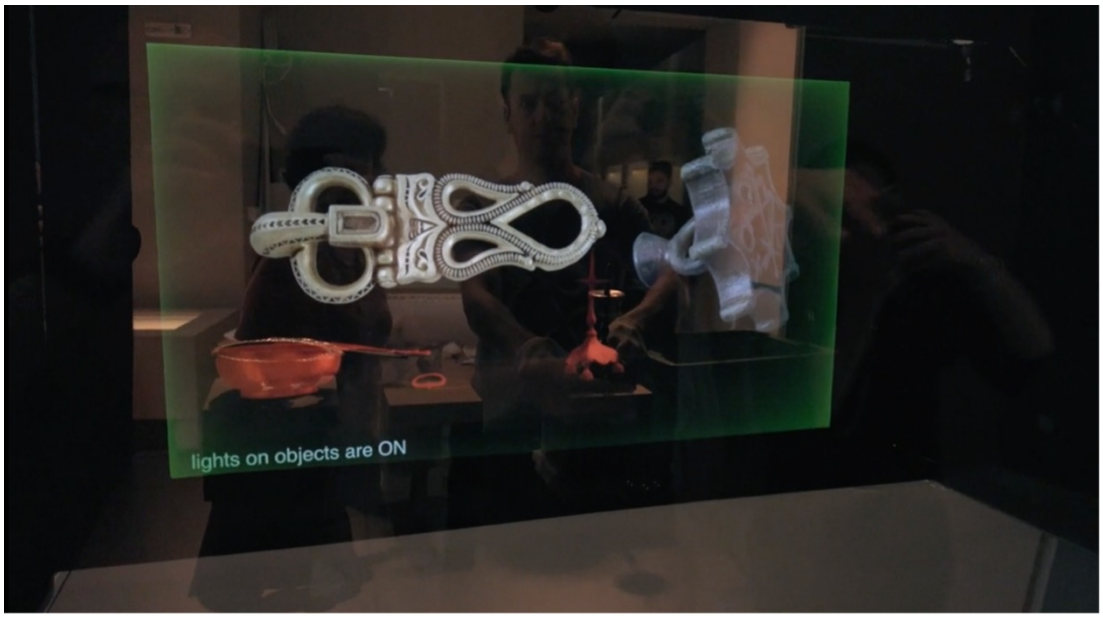


Figure 2.4: Screenshot from holographic showcase of Mytilene Treasure in Athens by Eva Pietroni, https://vimeo.com/285977554

Beyond AR and VR solutions for digital and visual solutions in the cultural heritage context, the concept of spatially augmenting physical objects and environments has emerged, which unlike the two previously modalities, does not rely on devices and applications. However, it could be supported by them. Raskar, Welch, and Fuchs (1998) first coined the term 'Spatially Augmented Reality' to describe the direct augmentation of imageries on physical environments of a user instead of their visual field. Malinverni et al. (2017) further explain the differences between visual augmentation on the person's field of view and environment by defining two paradigms; Window-on-the-World (WOW) and World-as-Support (WAS). WOW relates to screen-based modalities of AR. On the contrary, WAS relates to digital possibilities to blend the physical and the virtual worlds and applies to projections, spatial augmenting, embodiment and interactive experiences.

Bongers (2012) also addresses the use of projectors by introducing the 'break the frame' concept arguing that liberating projectors and projections from certain fixed contexts allows interactivity in outdoor and urban environments. He argues that beyond walls, many outdoor surfaces such as buildings, facades, and trees are suitable for projections. Breaking the frame using projections has been explored from multiple dimensions, including creating narratives from abstract environments (Bongers, 2012), and projected

creative walks (von Jungenfeld, 2016).

In the heritage context, projection mappings vary in form and style. In the past years, many heritage facades have become canvases for projection mappings. Events such as Son et Lumières in Durham and Lyon are light shows that illuminate architecture facades, urban objects and elements as creative installation and offer opportunities to experience the environment differently as a consequence of artistic installations and illuminations. Lovell and Griffin (2019) state that projections interact with architectural facades in three different ways, depending on whether and how the projections reference the building. They refer to cases where the buildings are used as screens and where the projections do not reference the canvas as 'Architecturally Passive'. However, if projections provide a symbiotic vision between the building and the media, they result in 'Architecturally Physically Active'. Furthermore, if projections offer abstract visualisations, reinterpret and interact with the building on a metaphysical level, they are 'Architecturally Methaphysically Active'. Passive and Physically Active projections are 'Magically real', whilst Metaphysically Active projections are 'Irreal'.

As discussed in this section, state of the art digital innovations to visually interpret heritage, address cultural presence and immersion through VR, AR, and the use of projections to spatially augment environments. This thesis further engages with the digital and visual interpretation of heritage by examining how digital integration of heritage in the material fabric of St Augustine's Abbey, further supports visitors' understanding of the site. Beyond AR and VR solutions, it explores how spatially augmenting the site with reconstructed artefacts in-situ supports the experience of the Abbey. Chapter 3 explains digital reconstruction frameworks and displays characteristics of SAR projections in order to blend the digital with the physical environment without restraining visitors' view of the Abbey on-screen and obstructing view of the ruins.

2.3.3 Visitor experience implications

Further to discussing the extent of digital solutions applicable in cultural heritage, this section explores how and considering what aspects of the developments impact visitor experiences.

From a visitor experiences point of view, digital technologies need to be assessed on how they perform and impact experiences. As Pujol-Tost and Economou (2007) state, VR systems implicated in heritage should have an easy user interface and interaction and, more importantly, deliver a pleasing experience. Natural interactions, as opposed to device-mediated interactions, are preferable as the user should be able to easily and promptly identify the context and interaction embedded in the system.

Experiential evaluations of AR and VR contribute to an extensive genre of knowledge in the field. Through this analysis, it can be understood how the system performs against efficacy, efficiency, and effectiveness. The first two relate to technology performance. The third concerns the extent to which experiences are enhanced using the technology. According to Pagano, Pietroni, and Poli (2016), to obtain audiences' opinion on both instrumental and non-instrumental attributes of the displays - as well as audiences' behavioural reactions to the displays, it is necessary to perform user experience evaluation of digitised cultural heritage. Evaluations with objectives as above allow examining the efficiency of the whole and fruition in context, particularly potentials such as memorability, attractiveness, and participation.

Pagano et al.'s (2018) analysis of holographic AR display with technical and narrative specifications has shown that even in circumstances where interactivity is null, high-quality presentation of digital artefacts facilitates sensorial immersion. Presentation of digital visualisations, in conjunction with museum objects, considering the realism of the design and the integration of the virtual and physical objects, creates an attractive environment for the audience and supports memorability. In the examination of behavioural characteristics and AR, Chung et al. (2018) employed the balance theory and positive attitudes (Heider, 1958) in finding the relationship between experience satisfaction, behavioural intentions, and mobile phone AR application in Korean cultural heritage destinations. Accordingly, they argue that satisfaction with AR in heritage context leads to positive attitude towards the destination, resulting in revisitation intentions.

Whilst a body of literature focuses on the correlation between interaction behavioural attributes, a different genre of studies focuses on how interaction could support or

interfere with heritage experiences. King, Stark, and Cooke (2016) question where engagement with digital heritage lies and whether digital heritage distracts the audience from the heritage content, instead driving attention towards the digital medium. The importance of the sense of place is also questioned here to consider whether sensemaking of a place is possible through encountering digitised heritage. Walker (2008) suggests that, for example in Dulwich Picture Gallery and also Kew Gerdens, London, young visitors were engaged with heritage as a result of excitement for the digital engagement medium. Furthermore, Hogsden and Poulter (2012) argue the need to move beyond offering engagement in physical reality and incorporate digital methods not limited to time and space. However, Deng, Unnava, and Lee (2019), based on observations of The Chicago Art Institute, argue that websites with high interactive and vividness VR systems such as Google Arts Project (GAP), offer a profound experiment that decreases visitors' intention to visit in reality.

Whilst AR and VR offer digital solutions to support cultural presence through immersion, and layering digital onto the physical using devices, SAR solutions could engage visitors in digitally enhanced experiences embodied in the physical reality. Approaches to cultural presence with SAR address particularly embodiment (Ciolfi, 2015), perception and awareness of place. Ciolfi (2015) states that technology design should concern human experiences in lived physical environments. In the case of heritage sites and other cultural institutions where displays are one of the core factors contributing to the visitor experiences, rich and effective integration of technology used for interpretation allows enhanced access and engagement. Ciolfi (2015) further explains that considering the importance of the heritage place, technologies designed for experiences in such environments need to support visitors with the concept of 'being there'. Additionally, due to conservation and preservation matters at heritage sites, limitations exist in changing layouts and structures. In such cases, SAR could support heritage experiences by further interpreting the place for visitors through digital technologies.

As part of the evaluation of enhanced experiences at St Augustine's Abbey, this thesis observes the AR and VR implications on visitation experiences by discussing matters such as the suitability and effectiveness of the integration of technology in the heritage site. Furthermore, the examination of technical traits of these interventions concen-

trates on experiential aspects of introducing SAR and VR in the heritage context, particularly if they provide a more informative and interactive experience. It discusses immersion and presence in the historical environment not only through VR headsets but also as a consequence of encountering visualisations in-situ in heritage sites. It addresses the impact of SAR on visitors' perception of the physical place by observing whether, firstly, SAR creates an immersive environment and, secondly, whether the SAR experience supports making sense of the remaining relics on site.

2.4 Authenticity and integrity in heritage

2.4.1 Interpretations of definitions by UNESCO

Research Question 3 introduced in Chapter 1 concerns perceived authenticity and realism in heritage. This section and the following sections attempt to explain the theoretical definitions of the two terms and the evolving meaning of the terminologies as they are in contemporary practice.

The definition of authenticity and its affiliation with Outstanding Universal Value (OUV) has changed. The World Heritage Convention was adopted in 1972. The wordings of the Operational Guidelines have changed over time. including the definitions of authenticity and integrity. The adaption of these terms is more dynamic and has led to new ideas such as dynamic authenticity, which is discussed later in this section. The 1977 version of 'The Operational Guidelines for the Implementation of the World Heritage Convention' associates authenticity with four degrees of "design, materials, workmanship and setting" (UNESCO, 1977, paragraph 9). The four degrees of authenticity present objective and intrinsic qualities of cultural heritage that exist within the physical fabric of the cultural heritage. The definition of authenticity has seen radical changes since 'The Nara Document on Authenticity' (1994). The Nara Document interprets authenticity as a dynamic quality, relative to who observes cultural heritage, where and when. It states that authenticity should be judged based on several qualities that allow examining wider social, historical and cultural notions. Thus, the Nara document considers authenticity as an extrinsic quality associated with

the cultural context to which cultural heritage belongs. Prior to the adaptation of The Nara Document, a property would qualify as authentic if considered as 'original' or with intrinsic values. Labadi (2013) argues that, with the adoption of the Nara Document, some nomination dossiers have interpreted authenticity as dynamic. This is the case, for instance, for the dossier of Notre Dame Cathedral in Tournai, Belgium, which does not limit the definition of authenticity to the original form but considers the site authentic relative to time as the cathedral, similar to many other medieval churches, has seen changes to its functions and fashion.

Stovel (2008) further discusses the implications of the Nara document in different cultures. Stovel (2008) refers to the 'Declaration of San Antonio' (1996), the regional meeting on authenticity and integrity in African context in Great Zimbawe (2000) and 'The Riga Charter on Authenticity and Historical Reconstruction in Relationship to Cultural Heritage' (2000) as three considerable aftermaths of The Nara Document which contextualise authenticity in different cultures. The 'Declaration of San Antonio' (1996) addresses authenticity with respect to the cultural diversity of the Americas. It acknowledges values such as identity, history as practiced by previous generations and by present people as a diverse and evolving community. The meeting on authenticity and integrity in Africa affirmed that the issue with imbalanced World Heritage List could be addressed with attention to Outstanding Universal Value criterion (vi) where the African voice is unequivocal. The Riga Charter relates to Nara by stating that "replication is of cultural heritage is in general a misinterpretation of evidence of the past, and that each architectural work should reflect the time of its own creation, in the belief that sympathetic new buildings can maintain the environmental context"(ICCROM, 2000, paragraph 5).

Boccardi (2019) argues that integrating novel cultural perspectives and increased contribution from communities in defining heritage values has led to the evolving definition of authenticity in the World Heritage Convention and states that it is essential to distinguish the facts and values of the cultural heritage in discourse to identify authenticity, particularly in relation to cultural heritage that have seen notable changes or developments. He contextualises the degree of authenticity and integrity in changes through the 'heap of sand' paradox. The heap of sand is in danger of losing its integrity if too

many grains of it are removed. This reflects on the fact that the heap of the sand no longer embodies the collection of elements that represent its value. It does not have enough substance to represent the features that convey the significance of the 'heap of sand'. In the heritage context, this example can reference the issue that if the material integrity is affected, authenticity would consequently be endangered. In other words, authenticity is lost in cases where alterations to the fabric of cultural heritage, the use or other characteristics of the site or loss of the credibility of significance statement are made.

Wang, Huang, and Kim (2015) observe the relationship between authenticity and integrity. They have introduced a conceptual framework (Figure 2.5) that comprises tangible and intangible values connected with cultural continuity. It centres on the idea that tangible and intangible elements of heritage need to be seen and complementary to each other as articulated in the 1972 Convention. In the framework, cultural continuity presents the historical timeline; together, completeness and intactness connect authenticity and integrity.

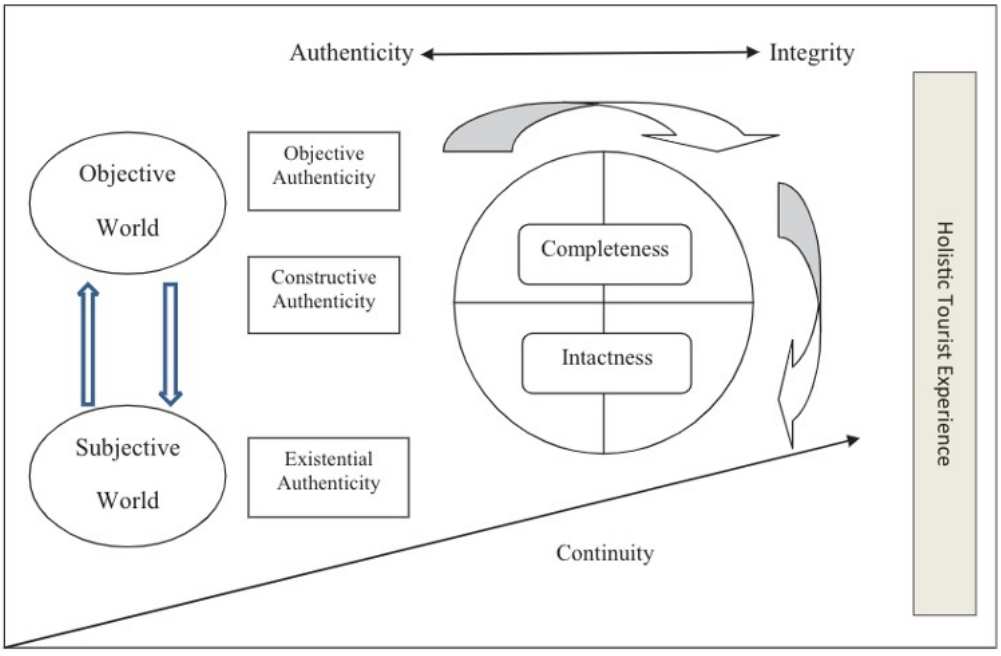


Figure 2.5: Conceptual framework integrating authenticity and integrity (Wang, Huang and Kim 2015) - Copyright: www.tandfonline.com

In practice - and in order to evaluate values based on the Nara Document on Authenticity - Lemmens, Nocera, and Van Balen (2004) at the Raymond Lemaire International

Centre for Conservation have introduced a tool, the Nara Grid, that identifies the dimensions and aspects of heritage against each other. Case studies below evaluate authenticity of European and Middle-Eastern heritage. Van Balen (2008) employs the Nara Grid to evaluate the authenticity of a water tower system, Bois de la Cambre in Belgium, after reconstruction. The water tower is a complex of two towers built in the 19th century. It is composed of a small tower, Petit Château, and a larger tower, Grand Château. Petit Château has been renovated and repurposed for the use of office buildings. Grand Château, however, has been abandoned since taken out of service. The Nara Grid evaluation of the Grand Château demonstrated that several factors underline its value and that the structure is worth preserving. For instance, the 'historic' dimension and 'spirit and feeling' aspect reference the 19th century cultural landscape. The 'scientific' dimension and 'material and substance' aspect draw on industrial heritage.

On a different note, Eshrati et al. (2017) employed the Nara Grid to evaluate the authenticity of the Manouchehri House, Kashan, Iran. Historically, Kashan was the centre of Iran's textile and weaving. The Manouchehri House was converted into a hotel residence with textile workshops, which has influenced conserving authenticity in this city. Additionally, the repurposing of the house has resulted in an increased sense of place in the people of Kashan. Accordingly, study results using the Nara Grid evaluation of the house demonstrated that the correspondence of social dimension and location and setting aspect has had the highest score.

The examples demonstrate that authenticity and integrity are intertwined. Additionally, in contemporary practice, the evaluation of authenticity is beyond the material fabric of heritage sites. However, discourses around authenticity and integrity are also engage with completeness and intactness. Chapter 6 employs the definition discussed in this section to understand visitors' negotiation of authenticity at St Augustine's Abbey. It observes the perception of heritage place and the contribution of reconstruction of non-existent artefacts on the site's perceived authenticity, integrity, and completeness.

2.4.2 Theoretical definitions

The term 'authenticity' has been theoretically discussed beyond the definitions by UNESCO. Authenticity in cultural heritage relates to an umbrella of discussions that concentrate on object and material qualities, constructive authenticity (Özdemir and Seyitoğlu, 2017; Park, Choi, and Lee, 2019; Wang, 1999) and existential authenticity (Kim and Jamal, 2007; Rickly-Boyd, 2012; Steiner and Reisinger, 2006). This section presents discussions on the negotiation of authenticity in cultural heritage based on values and materiality.

According to Pye (2001), an object's life begins at the time of its formation or creation. It then passes through various stages which could lead to its disintegration or transformation. Pearce (1992) describes the evolving form of object as a process in which the object gains a history. The process, or as Pearce refers to it, the life cycle of objects could be very complex and long. Pye (2001) argues that because of the process and cycles that objects see over the passage of time, subjects of curation, conservation, and archaeology require us to acknowledge the fact that a single truth about objects does not apply. People search for and see different meanings in objects.

Pye (2001) argues that it is essential to understand objects for any curatorial or conservation matters. Pye (2001) justifies this by referring to the fact that people or groups could perceive objects differently. Objects could also transmit alternative meanings in different contexts. Additionally, many qualities that are considered as indicators for the importance of objects could be damaged or distorted as a result of inappropriate conservation methods. Authenticity and integrity, along with value and significance, are terms generally employed to indicate the importance of objects. According to Pye (2001), value and significance are generally understood to embody tangible and intangible meanings. However, the later interpretations of the terms elaborate on cultural practices and associated intangible values. Conservation processes affect the materiality of objects. It is dilemmatic.

Holtorf and Schadla-Hall (1999) question whether the age and genuineness of cultural heritage should be given so much attention in negotiating authenticity. They argue that

many heritage sites are reconstructed and not old. Additionally, some authenticated objects are, in fact, fakes; this implies a flexible approach to authenticity where the public do not necessarily consider age as a criterion for authenticity of heritage. As such, the notion of authenticity to heritage consumers is perhaps more relaxed compared to practices in archaeology and conservation. Holtorf (2017) argues that, in the contemporary context, age value can also be attributed to reconstructions of objects. Holtorf (2017) affiliates the term 'pastness' with objects of the past, debating that pastness is not necessarily immanent in objects, but could be found in appearances such as patina, context including displays in cultural institutions, and correspondences with an audience's preconceived expectations. As such, Holtorf (2017) argues that pastness is not inherent in objects. It depends on the perception given of an object in a particular context. In heritage, according to Holtorf (2017), pastness is a prerequisite for perceiving cultural heritage. He draws on this concept by exemplifying the reconstruction of the Dresden Neumarkt area, Germany which was destroyed in WWII. The reconstruction presents buildings similar to their historical counterparts, and as if the buildings were never demolished. The reconstruction could be interpreted as fake, but it also demonstrates pastness because the reconstruction emerges from the concept of refocusing on history and historical architecture.

Poulios (2010) argues against the value-based approach in conservation by referring to the matter that value-based approach creates a discontinuity between objects that considered to belong to past and present people. Instead, the 'living heritage' approach (Poulios, 2010) presents a continuity between the past, present and future without boundaries. The tangible and intangible qualities of a heritage site are seen in this context; the values associated with heritage could be revealed in the continuation of the site's function, maintenance process, presence of the site's community on site, and changes to all mentioned due to circumstances (Poulios, 2011).

The conservation approach towards the Temple of the Tooth Relic (Wijesuriya, 2000), a World Heritage Site in Sri Lanka, is an example of a living heritage site where the notion of continuity was at the heart of conservation and reconstruction processes. Whilst material authenticity as stressed in the World Heritage Convention had to be considered, cultural and political matters played a key role in the strategies implemented to

protect damaged elements from further deterioration and also open to the temple to the public as soon as possible. The strategy evolved around restoring the temple to its pristine condition before its 1998 bombing. The discussion on the case restoration of stone carvings at the temple presents a dichotomy. As Wijesuriya (2000) reports, on the one hand, leaving stone carvings in a deteriorated state could demonstrate the damaged cause to the temple to future generations. On the other hand, incomplete or broken state of the stone works would have been inappropriate as the temple was actively being used. Additionally, minimal restoration of stonework could have affected its symbolic meanings.

According to Philippot (1972), preservation in some cultures is equivalent to conservation and restoration. It can be seen as a modern way of keeping contact with the cultural works of past times. One way of maintaining this connection is interwoven with concepts previously mentioned in relation to understanding and acknowledging the values and the means to revive them through restorations. A crucial concern here is how to integrate modern conservation without faking the original objects. Indeed, the way in which modern conservation is manipulated distinguishes the work of the restorer from the craftsman (Philippot, 1972).

Conservation of objects or complexes of objects is entitled to be safeguarded as a legacy of the past. Philippot's approach towards conservation of objects reflects on three notions: 1) The whole of the object, 2) Context and 3) The object's history. The importance of the whole of the object lies in the fact that objects are often conserved scattered, sometimes in pieces, across cultural institutions. Context relates to the immediate surroundings of objects which affects the correct interpretation of objects in relation to each other, as well as the bigger picture. It also relates to its traditional surroundings, and is very crucial to understanding the scale, significance, and social circumstances where the object was, or is, in use. Taking the object as a whole and its context into account, it is best to, if possible, conserve objects in-situ to maintain the full values.

Chapter 6 uses the theories the definitions presented in this section to examine visitors' point of view of the right to reconstruct cultural heritage. An analysis of experiences in

Chapter 6 draws conclusions on whether visitors appreciate encountering reconstructed artefacts on site and among the ruins. Discussions in Chapter 6 argue visitors' views for and against the right to revive non-existent historical artefacts through digital procedures and intervening on a heritage site with digital installations. This argument is supported by visitors' justification of our right to revive historical artefacts by alternating immaterial (digital) for materialistic reconstruction of artefacts.

2.4.3 Intervention and inauthenticity

Further to interpretations of authenticity and integrity in the two previous sections, this section debates the authenticity in reconstruction of cultural heritage. It focuses on key concepts closely related to the reconstruction of cultural heritage. It presents theoretical debates on (un)rightful reconstruction and addresses how reconstruction could impact authenticity and integrity of objects.

Between restoration and anti-restoration arguments sits the somehow challenging matter of protecting the ancient buildings. Restorers' and Anti-Restorers' reflect on the concept of protecting the values of ancient buildings from two very distinct ideologies. Therefore, their views on restoration distinctly differ.

Viollet-le-Duc (1990) is indeed an exponent of the movement whose followers perceived restoration as an act of imitating and reconstructing in the style of origin. They believed that by studying the monuments (specifically documentations on the features of the style they were built in), the construction methods incorporated, and buildings' details, it is possible to rebuild fragments or developments of the building. To Viollet-le-Duc, restoration meant as an act of re-establishing an edifice in a finished form, which actually may never have existed. Two questions arise within the context of restoration from Viollet-le-Duc's point of view. Whether to restore an edifice according to its original state, or to restore it considering later developments and modifications of the structure or the original form? He exemplifies the rebuilding of twelfth-century vaults, which were once reconstructed later. If the vaults in their later state are now fading and are in need of rebuilding, then should the vaults be built in the original state or in the later state? His response to such an argumentative question is to rebuild the structure

in accordance with its original state but not later modifications or interventions. To do so, the restorer must find the self in the position of the original architect and act as the original architect would do.

Contrary to Viollet-le-Duc and contemporary to him, Ruskin and Morris expressed their strong anti-restoration opinions in the 'Manifesto of the Society for the Protection of Ancient Buildings (1877)', primarily concerning the fact that we do not have the right to intervene in the creations of the past people unless absolutely necessary. It specifically draws attention to conveying the minimum intervention possible and preventing decay as much as possible by carrying out day-to-day care. Ruskin considers restoration the worst destruction a building can undergo, with false descriptions of the monument ruined. He believes each piece of work of art is unique and cannot be redone without faking it. Restoration would not be the genuine manifestation of the object in discourse (Ruskin, 1894).

Morris, in the aforementioned manifesto, points to two kinds of restoration. On the one hand, the act of restorations applied to monuments in early times; on the other hand, what restoration is framed into from Morris's contemporary time onwards. What distinguishes the two is how they are wrought and what the outcome is. According to Morris, restorations previously fulfilled the statement that "whatever history it destroyed, left history in the gap, and was alive with the spirit of the deeds done midst its fashioning, though harsh and visible enough, were by their very contrast, interesting and instructive and could by no possibility mislead" (Morris, 1877, p 1). However, he argues that approaches towards modern restoration seem more likely to "destroy something and to supply the gap by imagining what the earlier builders should or might have done" (Morris, 1877, p 2). The manifesto indicates only protecting ancient buildings and handing them over to the next generations with respect and integrity.

Cameron (2017) argues that a shifting attitude can be seen in debates and policies of reconstruction. In the meantime, fear of falsifying history and recreating a past that never existed is an issue that concerns authenticity and interpretation of the past. The Venice Charter (1964) emphasises the preservation of the historical values and respecting original materials. Subsequent documents, for example, the Burra Charter

(1979) agrees to reconstructions, even though it cautions about changes to places.

Jokilehto (2013) refers to reconstruction as a process in which something is constructed anew from lost or damaged things. It could, however, result in new styles relevant to the period of reconstruction or re-establish identities. However, approaches to reconstruction and authenticity of heritage are different in regions and contexts. Jokilehto (2013) presents two examples in the Far East. Firstly, the periodic reconstruction of the Shinto Shrines (World Heritage Site) which is based on the cultural continuity. In this case, authenticity has no relationship with materiality. It is primarily attached to the function and subsidiarily to form. Secondly, the reconstruction of the Forbidden City, Beijing, which raised concerns about authenticity, integrity and significance of the site. As Jokilehto (2013) argues, reconstruction of cases such as the Forbidden City could mean restoration. In 2007's 'International Symposium on the Concepts and Practices of Conservation and Restoration of Historic Buildings', it was concluded that partial reconstruction of the Forbidden City was acceptable.

The debatable concern is whether reconstructed cultural heritage are considered as fakes, identical authentics; or are they authenticated in relation to their wider cultural and social contexts? Piazzoni (2020) discusses the issues with reconstructed landscapes and argues that reconstructions cannot counterfeit the authenticity of the historical landscapes. As such, reconstructions could be seen as deceptive simulations, rather fake than authentic. Piazzoni (2020) argues that identical reconstructions could also blur the distinction between historic and themed settings which simply convey visual and spatial qualities of heritage; a notion that is also referred to as 'Disneyfication' (Kennedy and Kingcome, 1998; McDonald, 2011). However, reconstruction of landscapes support people with constructing a vision of the authentic. This process is enhanced by fakeness. According to Holtorf and Schadla-Hall (1999), people construct an idea of authenticity by differentiating the real and the fake based on their judgment. Authenticity and fakeness are also evaluated in the context of performance-based heritage and enactment, particularly concern staged authenticity at heritage destinations. Ucko (2000) describes reconstructions as attempts to focus on the places and endeavour to enliven sites.

MacCannell (1973) initiated a stream of discussions on staged authenticity, arguing

that tourism experiences are based on inauthenticity, and in search of authenticity, one could face inauthenticity. Cohen (1979) explains that in MacCannell's thinking, inauthentic tourism places are created for visitors who would accept them as real without suspecting. Cohen (1979) further explains that not all situations fall within MacCannell's justification. Hence, further elaboration on the primary schemes of authentic and staged is required. Therefore, Cohen (1979) introduces four situations emerging from the notions of real and staged and the combination of the two:

1) Real-real or authentic, which is accepted as real.

2) Staged-real, where the viewer is not aware of the staging and thus, perceive it as real.

3) Real-staged, which depicts the denial of authenticity where the viewer doubts authenticity due to the idea that scenes could be manipulated to mislead the viewer.

4) Staged-staged, which relates to contrived scenes admittedly staged, and the viewer is conscious of it.

The four situations introduced by Cohen (1979) support understanding and debating fakes and reals, which have been focal in discussions on authenticity and introducing new terminologies on the continuum of fakes and reals. Bruner (1994) reflects on the topic by debating 'authentic reproduction'; an oxymoron which requires clarification and justification as to where it stands in relation to authenticity. He explores 'authentic reproduction' by expanding on four senses of authenticity, beginning from 'historical verisimilitude' where reproduction is an attempt to resemble the historical, demonstrating credibility and being convincing to the viewer, moving toward the immaculate simulation of reproductions. Bruner (1994) further explains that 'authentic reproductions' could also be seen that originals. Although, he explains that, in this context, no original could be an example of authentic by definitions. The last sense of authenticity stems from the concept of authority and based on who has the authority to authenticate the reproduction. Bruner's (1994) idea of resemblance and verisimilitude is also used to explain iconic and indexical authenticity as perceived by the audience. Grayson and Martinec (2004) explain indexical and iconic authenticity of reproductions, respectively, based on having a spatiotemporal link and physical resemblance with the original. The latter correlates with Bruner's (1994) historical verisimilitude.

Based on the evolving definitions of authenticity, particularly the before and the Nara document, Labadi (2010) introduces the term 'post-authenticity' for when fakes and reals become inseparable, and authenticity could be continuously negotiated in reconstructions. Accordingly, Foster and Jones (2017) have outlined a principle in relation to authenticity and replicas in the contemporary context. The principle is built on four pillars: 1) In contemporary definitions of authenticity, replicas too are authentic. Their material, social context, use, and location inform about experiencing and negotiating authenticity. 2) Replicas have composite biographies related to the original. Relatedness is a key characteristic of replicas and, on a larger scale, the values and meanings of replicas are descendent of their "relationship with people, places, and other things"(Foster and Jones, 2017, p5). 3) Replicas require the same attention in conservation and curation as the originals and are subject to the same evinced-based and research-led heritage studies. 4) Replicas raise ethical issues, especially in relation to copyright, identity, and integrity - including the possibility of physical impact on the original historic.

The arguments presented in this section are later used in Chapter 6 to discuss the implications that digital reconstructions of artefacts at St Augustine's Abbey may have on the site's authenticity. This research questions whether digital interventions at this site of great historical value with digital modern installations is right or appropriate, and to what degree they become elements that fit in and help envision the site better at the same time. Additionally, specifically in relation to Stage 2, it questions whether, considering the presence of digital installations on site, visitors perceive an authentic experience. In relation to the whole of the object, Chapter 6 examines how spatially augmented a more complete image of non-existent artefacts on site could contribute to visitors' understanding of them and the site.

2.5 Aura of computer-generated imageries

2.5.1 Aura

Section 2.4 discussed fundamental concepts on authenticity and inauthenticity considering reconstruction heritage. This section discusses concepts affiliated with digital heritage – specifically the authenticity and realism of reconstructed heritage in digital form. Discussions on digital visualisations of cultural heritage are not limited to application, context, technological advancements, or usability. From a theoretical point, digitised heritage contents are subject to analysis with respect to their aura and authenticity. Virtual restorations of culture, unlike physical reconstructions, are immaterial. Therefore, topics relevant to physical reconstruction involving materiality do not apply. However, in virtual restorations, several theories must be acknowledged concerning the authenticity of the digital artefact. Since subjects similar to authenticity are shared between physical and virtual heritage, such discussions for virtual heritage can be established upon existing arguments on physical restorations (Vico, 2018).

However, some concepts, including authenticity and possibilities of endlessly reproducing heritage through technology, are interpreted differently in relation to digital heritage. Benjamin (2008) (first published in 1935) argues that each piece of artwork has an aura, a connection with the space and time of its creation. In the case of reproducing artworks, even perfectly wrought, the reproduction lacks the unique existence and connection with the place and history. Benjamin states that through technological reproduction, authenticity eludes because "a technological reproduction is more autonomous, relative to the original, than one made by hand" and because technological reproduction "can place the copy of the original in situations beyond the reach of the original itself" (Benjamin, 2008, p 6).

Bolter et al. (2006) discuss Benjamin's aura in relation to digital media, specifically mixed-reality technologies. They argue that technologies' limit to produce aura depends on the degree to which it convinces "the user that she is in the presence of the authentic; presence and authenticity therefore depend on assumptions that the user has about the technology." (Bolter et al., 2006, p 29). However, regarding presence, aura could be

enhanced by any digital media by building a sense of "distance-through-proximity" (Bolter et al., 2006, p 29). The complexity of the aura of digital artworks and media remains a question because, as Bloomer and Marchese (2017) state, such media can be temporary. They may exist in a specific time and space.

2.5.2 (In)authenticity of digital reconstructions

Jeffrey (2015) presents ideas concerning challenges with virtual heritage to understand the past instead of considering heritage visualisations as digital formats of real objects and sites. Jeffrey (2015) argues it is vital to understand how virtual heritage is received by its audiences. Therefore, aura and its relationship with virtual heritage, digital representation, and the creative process of reconstructing heritage require attention. Critical arguments, such as Cameron (2007) on the authenticity of 3D visualisation, suggest assessing that the authenticity of visualised heritage is far more complicated than that of physically reconstructed artefacts. The problematic dilemma in the authenticity of virtual heritage lies in the fact that visualisations demoralise perceived authenticity by obstructing access to materiality, the historical and the biographical of cultural heritage. However, Jeffrey (2015) argues that aura can be passed on from the original to its reproductions, including digital visualisations of cultural heritage. The digital forms could add or influence the aura or the authenticity of the original object. As such, they become part of its ongoing biographical process.

In response to the authenticity of virtual heritage, Jones et al. (2018) examined the authenticity of visualisation in the context of community participation. Their study investigated whether visualisations are perceived as authentic and whether they influence the perceived authenticity of their physical counterparts. Thus, they argue that digital visualisations, even though lacking physical presence, meditate perceived authenticity with their alluring quality and present aura. Additionally, their results indicate that authenticity is perceived in relation to realism and visualisations that look alike to the physical artefacts. However, absent attributes of the cultural artefacts in their visualised replicas, such as tangibility, clearly distinguish the original and the virtual. In the case of virtual objects, lack of physicality or locale could mean that they are seen

as otherworldly, free-floating representations of objects; while they could offer signs of age, they are resistant to consequences of time on degradation. Thus, in this notion, aura is questionable due to visualisations' lack of connection with objects.

Authenticity is only one construct in assessing audiences' perception of visual heritage. According to Gilbert (2016), authenticity in this context relates to whether the virtually mediated environment offers an expected experience. Authenticity in this context is evaluated based on the facts whether the visualisation supports audiences' Bayesian normalities as well as users' intention. Such theory can be employed to explain Jones et al.'s (2018) results on the fact that audiences perceive authenticity in visualisation when a comparison is made with the physical reality. Hypothetically, the sensory rendering of visualisation requires such advancements that the outcome is indistinguishable from reality (Slater, Gonzalez-Liencres, et al., 2020). While higher quality rendering of computer-generated imageries is crucial in achieving a realistic effect, dynamics embedded in the virtual environment are also of substantial importance. However, as visualisations increasingly move towards realism, the belief and illusion of realism stay apart.

Theoretically, the authenticity and aura of digital visualisation of heritage are discussed and challenged as reconstructions and replicas. Discussions on aura and authenticity constitute these concepts in relation to digital counterparts of heritage. The question this thesis attempts to answer is that even though heritage visualisations are considered of aura and authenticity as standalone displays, could they be similarly perceived when presented alongside archaeological artefacts in original geographical environments? The analysis presented in Chapter 6 explores visitors' negotiation of the authentic and the inauthentic terminologies, and how integrating the virtual and the physical influences perceived authenticity of both the physical site and the visualisation.

2.5.3 Precedents of the real

This section reflects on the qualities that theoretically define realism and terminologies around the reproduction of realities such as representation, simulation, and hyperrealism. Baudrillard (1994), in the opening chapter of 'Simulacra and Simulation', draws

on some social, geographical, and political examples of the real and simulation of the real; the hyperreal. He defines a variety of representation, simulation and hyperrealism initiating from the real and leading to hyperrealism - the process by which the copies of the real lose their references to the real, thereby creating their own reality, the hyperreal. To Baudrillard, "simulation is no longer that of a territory, a referential being or a substance. It is the generation by models of a real without origin or reality: hyperreal" (Baudrillard, 1994, p 1). The real produced based on this does not require to be rational, "because it does not measure itself against either an ideal or negative instance" (Baudrillard, 1994, p 2).

In hyperrealism, as Baudrillard claims, reality can be produced an indefinite number of times without the need of being rational, as it no longer compares to any idea of reality and ideal. Simulation feigns what one does not have. It is not a matter of pretending (masking the reality) because it "threatens the difference between the "true" and the "false", the "real" and the "imaginary." " (Baudrillard, 1994, p 3). Simulation and representation also differ. The concept of 'representation', according to Baudrillard (1994), initiates from the sameness of the sign and the real, even if from a utopian point of view. According to Baudrillard, an image could have four successive phases:

> "it is the reflection of a profound reality;
> it masks and denatures a profound reality;
> it masks the absence of a profound reality;
> it has no relation to any reality whatsoever: it is its own pure simulacrum"
> (Baudrillard, 1994, p 6)

Using Baudrillard's theory of hyperrealism, Voase (2010) exemplifies successive phases in reaching a pure simulacrum in historical contexts. He accordingly argues that hyperrealism is found in multilevel stages, from being a pure reflection of reality to a reality superseding the absence of reality. Voase (2010) exemplifies his approach with Beamish, an open-air museum in County Durham, England, as level two of the successive phases of an image masking a profound reality. This is justified by the fact that representation at Beamish is faithful and does not intend to modify the past. However, similar to many other examples, there is a demand to adapt to the present time

and interpretations due to heritage management and visitor attraction requirements. Beamish is considered level two of the successive phases of an image because it distorts the basic reality and a moment of reflection is needed to perceive its inauthenticities. However, Voase (2010) explains, The Jorvik Viking Centre, York, is level three of the successive phases of images. The reality behind the exhibition of the site is unknown as its history or archaeology is not recorded but in sparse evidence. Therefore, what The Jorvik Viking Centre presents covers the absence of the profound reality. The reality behind the exhibition cannot be known and remains absent. Voase (2010) concludes that in an attempt to create realism in heritage interpretation, the departure from the real is greater.

Deleuze (1990) explains simulacra by recognising the differences and disparities between the original and the copies. Deleuze defines the original as a model whilst the copies are simulacrum. The model is an idol of which simulacra are further generated. Thus, simulacrum has many dimensions and depths that an audience may not be able to grasp easily. Copies and simulacra are distinguished based on the fact that copies are secondary possessors. Simulacrum, contrastingly, are built on a dissimilitude, implying a perversion, an essential turning away. Hence, the domain of image idols classified into iconic copies, likeness, phantasmic simulacra, and semblance. However, one cannot consider simulacra as copies of copies or an "indefinitely degraded icon" because copies are affiliated with resemblance, and simulacra is an "images without resemblance" (Deleuze, 1990, p 295). Based on Deleuze's theory of simulacrums, La Rocca (2011) explain the differences between reals and fakes by looking at the photography of Cindy Sherman. La Rocca (2011) explains that by looking at the photographic images, one questions whether it is a documented image, a staged scene or a forensic image. The viewer is compelled to configure the "differences between the real and the fake, the documentary and the fabricated, the forensic and the fictional" (La Rocca, 2011, p 321).

Manovich (1996) argues that computer graphics have achieved photorealism, not realism by doing so they fake the photographic image and not our experience of the reality. The study by Konijn, Der Molen, and Nes (2009) on the relation between emotions and perceiving realism has shown that viewers of visual media with negative emotions

during the experiment significantly perceived more realism compared to those with no such sentiments. The perception of realism, according to Busselle and Greenberg (2000), in audio-visual content is a multidimensional or multileveled concept. It "may pertain to the program at global levels or more specific ones, to its literal contents and the images conveyed, to the depicted people and places, situations, and behaviors, and so forth" (Konijn, Der Molen, and Nes, 2009, p 319).

Chapter 6, accordingly employs the theoretical definition of the real and its precedents and perceived realism of digitally reconstructed images. By employing the theories presented in this section, Chapter 6 investigates the perceived realism of digitally reconstructed artefacts. Using the terminologies of hyperreal, representation and simulation, Chapter 6 intends to understand how 'real' our visitors find the reconstructed imageries. Additionally, to what degree do visitors perceive digital reconstruction installations as real when they observe them in heritage context among historical ruins?

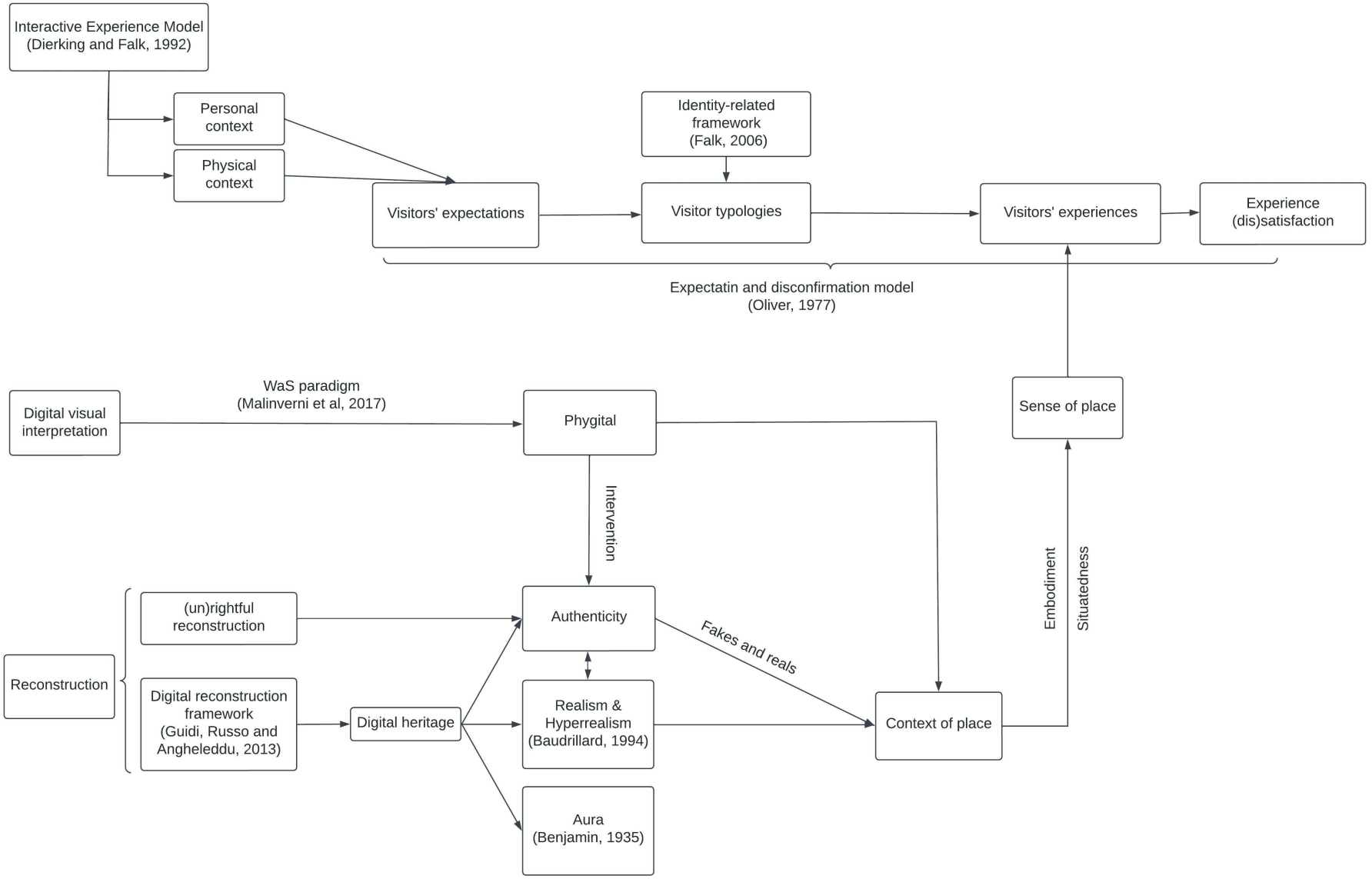


Figure 2.6: Theoretical linage diagram

2.6 Conclusion

As the interpretation methods at cultural heritage sites evolve, visitor experiences require observations beyond what is already established. Specific empirical case studies that consider broader experience domains, including assessing the settings, exhibits and individual visitor interpretations, allow more in-depth analysis of visitor experiences. At particular heritage sites, visitor experiences are also assisted with digital technologies where further information channels enhance observation and learning about intangible contexts. However, frameworks based on psychological and experiential aspects of visitor experiences outline fundamental notions within experience realms; they do not adequately respond to recent experiences, particularly digitally enhanced experiences.

Integration of digital technologies such as AR and VR in heritage is expanding. A variety of modalities providing different technical prospects is increasingly implemented in the field. In line with AR and VR technology developments, evaluation models are developed that assess functionality and feasibility of digital innovations. Through layers of computer-generated imageries and environments, VR and AR offer immersive and interactive experiences of the past that no longer can be perceived in reality. Effective adaptation of such technologies creates digitally-enhanced experiences where the visitor is offered additional opportunities to have an enhanced experience, particularly concerning the realms of experience-education, entertainment, aesthetics, and escapism. From an experiential perspective, user or visitor feedback on AR and VR implication on heritage and museum experiences requires attention to probe the advantages and disadvantages of such technologies in these experiences.

This thesis evaluates realised experiences at St Augustine's Abbey in various scenarios, from conventional to digitally-enhanced experiences. It reflects on the current literature emphasising the variety of aspects concerning heritage experiences. The evaluation includes probing visitor expectations and experiences and comparative analysis to examine which experience modality visitors favour and which attracts which group of visitors. In addition, it draws on multidimensional aspects of digitally-assisted experiences, including engagement factors, integration of digital interventions in historic context, and museums' archaeological artefacts.

Chapter 3: Methodology

3.1 Introduction

This chapter explains the theoretical and practical methodologies in evaluating heritage experiences offered by English Heritage at St Augustine's Abbey (Stage 1), as well as planning, organising and conducting experiences with the use of in-situ projections of non-existent artefacts onsite (Stage 2). It discusses digital workflows for reconstructing and displaying non-existent artefacts on Abbey grounds and survey questions for Stages 1 and 2 of the study. Section 3.2 justifies the importance of the research site, St Augustine's Abbey, as part of the World Heritage Site in Canterbury, UK. It further discusses the site's history by referring to critical developments and events that have led to the current state of the Abbey as an archaeological ruin. Lastly, it discusses the Abbey site and its offerings in both archaeological ruins and in the visitor centre.1

Section 3.3 is shaped around the different heritage experience modalities at St Augustine's Abbey evaluated in two stages of the research study. It begins with conventional heritage experiences (Stage 1), which were based on ordinary arrangements at the Abbey site managed by English Heritage. This section discusses Stage 1 experiences at the Abbey by introducing a variety of modalities such as self-guided and guided tour visits and the availability of audio-visual technologies for visitation experience. Moreover, it discusses how offering a different visitation experience in an altered physical context may add and reveal other dimensions to the experience and trigger visitors' perception of the site. This section examines the impact of projection displays on the perceived physical context of the site as well as the perception of dark and aesthetic lighting on

the physical settings onsite. This is followed by heritage experiences at Stage 2, which were exclusively organised as part of this research project. It discusses the outline of the experience, including guiding visitors at night and introduces digital interventions in the form of Spatial Augmented Reality installed within the archaeological ruins.

Section 3.4 focuses on the digital reconstruction workflows. It starts by introducing nominated artefacts for reconstruction and their significance and contribution to envisioning a more comprehensive image of the historic Abbey. Further on, it discusses practical methods employed in order to obtain historical data, translate data into digital models and ultimately present the reconstructed images in projection formats.

Later, Section 3.5 explains the data collection approaches, including the design of qualitative surveys, and justifies the subject and type of individual questions presented in the surveys at Stages 1 and 2. It presents the general themes that this thesis questions in relation to the variety of experience modalities offered at the Abbey and, more specifically, concerns heritage experiences, visitor engagement with audio-visual implements, authenticity and realism.

3.2 The research site

3.2.1 World Heritage Site

This section discusses the importance of the qualities of St Augustine's Abbey and why it was selected as the research site. As mentioned in Chapter 1, the research questions focus on heritage sites and heritage visitor experiences. St Augustine's Abbey was selected as the research site because, firstly, as part of a World Heritage Site (WHS), it is of Outstanding Universal Value. The evaluation of heritage experiences at Stages 1 and 2 engages with discourses closely affiliated with heritage, especially authenticity and integrity. In particular, it examines the potential positive and negative consequences of digital interventions on the authenticity and integrity of the site. Secondly, the site has seen many events that have led to its condition today. Thirdly, it offers a unique visitor experience due to the fragmentary conditions and limited artefacts on site. This

section discusses the significance of the site as a WHS. The following sections discuss the nomination of the site concerning the second and third reasons, respectively.

St Augustine's Abbey is part of the World Heritage Site 'Canterbury Cathedral, St Augustine's Abbey, and St Martin's church' designated in 1988 by UNESCO (ICOMOS, 1988). The Abbey is located outside and to the east of Canterbury city walls, in the South-East of England. The World Heritage Site 'Canterbury Cathedral, St Augustine's Abbey, and St Martin's Church' was nominated based on criteria (i), (ii) and (vi). Although, as stated in the nomination document, the three criteria do not equally apply to the three monuments.

Criteria (ii) requires sites to "have exerted great influence, over a span of time or within a cultural area of the world, on developments in architecture, monumental arts or town-planning and landscaping" (UNESCO, 1988, paragraph 24). In the case of St Augustine's Abbey, criteria (ii) refers to Abbey's influence on English society far beyond Kent and Northumbria. Its scriptorium is considered to have been a great example of insular book production (UNESCO, n.d.)[1]. Thus, as a result of Abbey's development in education and literacy, Canterbury had become a centre for learning in Britain. As for the selection criteria (vi), "be directly or tangibly associated with events or with ideas or beliefs of outstanding universal significance" (UNESCO, 1988, paragraph 24). All three monuments are directly linked to the introduction of Christianity in the Anglo-Saxon period.

[1]UNESCO (n.d) Canterbury Cathedral, St Augustine's Abbey, and St Martin's Church. Available at: https://whc.unesco.org/en/list/496/ (Accessed: 21 March 2022).

Figure 3.1: Canterbury Cathedral, St Augustine's Abbey, and St Martin's Church - Map of the inscribed property, UNESCO, 1988

St Augustine's Abbey is no longer a place of worship or spiritual learning. It is presented to the public as a historical heritage site. However, interpretations of life and practice at the historical Abbey are made through audio-guide narration, interpretation boards, and displays at the visitor centre. Chapter 2 discussed that information about people and life in historical contexts makes it easier for viewers to connect with the site and envision a more comprehensive image of the site's historical use.

This study intends to understand how much the current audio, visual and guided interpretation methods at St Augustine's Abbey convey its Outstanding Universal Values with respect to the history of the site, including its developments, people and practice of Christianity. It observes how visitors perceive interpretation of the historic Abbey and make sense of the heritage place while visiting. Chapter 4 examines this notion by evaluating what visitors to the Abbey expect from their visit to a World Heritage Site and to what extent interpretations provided at the Abbey reference the site's significance. Chapter 5, accordingly, explores the impact of the presence (or lack) of monks or other

historical characters in the VR recreation of the study in immersing the viewers into the life and practice context of the site. Chapter 6 assesses two closely affiliated subjects with World Heritage Sites, authenticity and integrity, in relation to reconstructing the past and historical artefacts as well as intervention in historical heritage settings.

3.2.2 The monastery in time

St Augustine's Abbey was founded by St Augustine c.597 AD. Pope Gregory the Great sent St Augustine on a mission to re-introduce Christianity to the south of England. For almost 1000 years, St Augustine's Abbey was the centre of learning and spirituality until 1538, when it was suppressed under the order of Henry VIII as part of the dissolution of the monasteries. The Anglo-Saxon monastery was used for multiple purposes, such as accommodation for the monks who accompanied Augustine from Italy as well as burials for the kings and the archbishops that according to Roman imperial traditions had to be outside of the city walls (Sherlock and Woods, 1988). The Abbey is believed to have included domestic buildings such as a dining hall, dormitory, and a series of chapels (Sherlock and Woods, 1988).

The Abbey has seen many events leading to its current state as an archaeological ruin after different series of demolishment, rebuilding, and developments. For example, at St Augustine's Abbey, the practice of the reformed abbots was marked by a few alternations to the buildings, such as the enlargement of St Peter and St Paul churches, demolishment of the west wall, and the expansion of the nave. Present archaeological evidence shows at least two phases of the building below the current cloister. Some other alterations during the late Saxon times include the completion of a tower under Abbot Wulfric, which its precise location is not clear but may correspond to a massive foundation uncovered in the mid-twentieth century. The construction of a rotunda, an octagon building that involved the demolishment of parts of the church of St Peter and St Paul, St Mary's, the removal of the shrine of St Mildred and some other sacred relics. This was abandoned unfinished at the death of Abbot Wulfric in 1061. In medieval times, after the fire in 1168, the Abbey went through a process of rebuilding for fixtures and fittings to become more elaborate. "The church was in great part burnt; in this

fire, many ancient documents perished, and moreover the very shrine of St. Augustine and many saints of the place were woefully damaged" (Davis, 1934, p94).

From the beginning of monasticism, it was intended that an abbey should be as self-sufficient as possible, and therefore it needed land. St Augustine's Abbey developed extensive estates with lands being given by King Ethelbert and King Cnut. In 1536 most of the minor monastic houses with less than £200 annual income were closed. St Augustine closed in 1538 as part of the closure of larger abbeys. In 1541 Henry VIII gave orders to dismantle the church. Therefore, the lead from the roof was melted down and sold to provide cash for the treasury. Much of the stonework was sent to France to build the fortification of Calais. The site was gradually reduced to its foundations, except for the north wall of the nave and the Ethelbert Tower. In 1692, Canterbury was once again affected by an earthquake that damaged the Ethelbert Tower and possibly the palace buildings. By the 1770s, some of the old palace buildings were used as a brewery, maltings, and public houses, with the courtyard being used as a bowling green and skittle alley.

Figure 3.2: Remaining foundations of the Nave area at St Augustine's Abbey, Canterbury

As mentioned at the beginning of this section, various historical events have led to the fragmentary conditions of the site. St Augustine's Abbey was chosen as the research site to evaluate heritage experiences at a site where the current artefacts are displaced or demolished as a consequence of many historical events.

Research on St Augustine's Abbey is dominated around the historical significance of the site. Archaeology and excavation (Saunders, 1978; Sherlock and Woods, 1988) has had great a contribution to understanding the site. Information on the topology of the site and the buildings of the monastic complex (Tatton-Brown, 1991) contextualise the settings of the Abbey before its destruction. Additionally, literature on theology, life, and practice at the Abbey (Smith, 1978) or the arts and learning (Heslop and Mitchell, 1997) interpret historical narratives intertwined with cultural practices on the site. This research employs an interdisciplinary approach to evaluate how and to what extent the significance of the site is interpreted for the visitors. It shifts the focus from the Abbey to understanding experiences on the site. It examines the perceived value of communicating historical contexts for the visitors as they experience the archaeological ruins. This study intends to evaluate how and to what extent fragmentary conditions influence visitors' perception of the site and making sense of the physical context of the Abbey that once existed. It also intends to justify the cues visitors make to interpret the historical Abbey by correlating artefacts displayed at the visitor centre and observing the remaining ruins. Chapter 2 discussed the 'whole of the object' and 'context of place' and the historical context in relation to the authenticity. In the analysis of heritage experiences in Chapter 4, the whole of the object and the historical context are examined to understand the impact of seeing a displaced or fragmented artefact in creating a vision of the historical site. Chapter 5, accordingly, examines the impact of reviving non-existent or displaced artefacts in-situ to evaluate the impact of appropriate physical context on heritage experiences.

3.2.3 The Abbey site today

The site of St Augustine's Abbey is organised into two spaces: a visitor centre and an outdoor display of the Abbey ruins. St Augustine's Abbey, today, is managed by English Heritage which looks after hundreds of properties with historical and monumental significance from the ancient past to contemporary times across England. In 1997, the archbishop of Canterbury at the time, Dr George Caray, opened the visitor centre at St Augustine's Abbey on the 1400th anniversary of the landing of St Augustine in Kent. The visitor centre houses a collection of Abbey artefacts which are presented in

groups depending on the historical era they belong to, their applications, functions and make. It includes several stone masonries such as shafts, column capitals, vaults, stone tooling, and decorations. A collection of tiles showcases a variety of tile patterns and motives once used for Abbey's flooring and decorations. Throughout the visitor centre, displays of small finds, including coins and other valuable archaeological objects such as a medieval seal, the grace cup of Abbot Foche, and engravings, can be found. However, an additional significant number of excavated artefacts are conserved by English Heritage in Dover Castle alongside collections of other archaeological artefacts and are not accessible to visitors at either sites.

Figure 3.3: Display of artefacts at St Augustine's Abbey's visitor centre

On the outside of the visitor centre lie the remaining ruins of the monastic complex. The relics on the Abbey grounds are remains of many developments and destructions that it had seen from its early days until after dissolution. As one enters the grounds, the remains of the nave area built in the Anglo-Norman era are prominent. The north wall of the nave aisle is standing with brick added on the top from the time when the Abbey was converted to a palace for Anne of Cleves. However, of the many Norman columns of the nave (east to west), only a number of fragmented column bases remain

on site. Thus, a primary reason to select this site for the project lies in the fact that less remains of its height and volume, and within what remains, many objects are fragmentary or displaced.

Further to the west, the foundation structure of the Wulfric Rotunda remains. The crypt and the Chapel of Our Lady the Angels are recognisable further to the west. Only an arch remains onsite from Abbey's early church St Pancras' Chapel. Within the current boundaries of the Abbey precincts also lies the location of the cloister, although no relics are in place. Some ruins, however, are not accessible as owned privately by other institutions such as The King's School and Canterbury Christ Church University on the original precincts of the Abbey. The Abbey grounds is open for individual and group visits. Local residents may request access to the grounds for leisure. Visitors can follow interpretation boards (Figure 3.4) installed on the Abbey grounds to find information about historical structures and people relevant to different locations on the site. The interpretation boards narrate the history of the Abbey and stand to inform the visitors and guide them from one point to another to observe the remains.

Figure 3.4: Interpretation board installed at St Augustine's Abbey

English Heritage offers a combination of experiences at the Abbey within the visitor

centre and on the archaeological grounds. Guided tour visits are available for group bookings. English Heritage also offers members exclusive events on the Abbey site. An audio guide is also on offer to guide visitors on the grounds. The information provided is complementary to the interpretation boards installed on the site. The following section discusses a variety of possible experience modalities at the Abbey.

3.3 Experience modalities

This section examines the different visitor experiences offered at St Augustine's Abbey. The following subsections describe the data collection sessions during which data on heritage experiences were obtained. Chapters 4 and 5 present a more detailed analysis and in-depth discussion of the visitor experiences and the different experience modalities introduced here.

Heritage experiences are multidimensional. Therefore, visiting heritage sites in different modalities allows visitors to experience the site differently and benefit from aspects that are not necessarily included in conventional experiences. The principal intention for evaluating different experiences at St Augustine's Abbey is the need to understand which experience modality offers a more engaging, informative, and satisfying experience for diverse social demographic visitors. In this research project, observation of visitor experiences at St Augustine's Abbey took place in two stages (as discussed in 3.3.1 and 3.3.3). During both stages of the study, visitors were recruited to observe the site in either a guided tour or self-guided visit and fill out a self-administered questionnaire afterwards. Later in this Chapter, Section 3.5 explains the questionnaire design and a mixed-method approach that involves a combination of qualitative and qualitative data collection. Section 3.5 also discusses the rationale behind questionnaire themes, and individual questions asked at Stages 1 and 2.

3.3.1 Stage 1: Conventional experiences

During Stage 1, self-guided visits were arranged for visitors on multiple occasions where visitors would explore Abbey's visitor centre and the ruins on their own. The self-

guided visits are chiefly examined in Chapter 4 to probe how different visitor clusters perceived the site through their personal interpretation of the site. It investigates whether visitors' observation of the site and the existing displays are adequate for having an engaging and informative visit or whether further interpretation is required to appreciate the site more comprehensively. The self-guided visits are shaped around the observation of the artefacts displayed at the visitor centre and the archaeological ruins on the Abbey grounds. Concerning the archaeological ruins, the thesis foremost attempts to understand what and how much self-guided public visitors may grasp from walking through the site. Additionally, how much do the artefacts displayed in the visitor centre assist the public in developing a better understanding and vision of the historical Abbey when observing the grounds?

While the outcome of the self-guided visits heavily relies on personal observation and reflection, the implications of interpretation offered by the site through interpretation boards (Yeats, 2013) and audio guides on the visitation experience are also explored. The interpretation boards narrate the story of Abbey. The audio guide, available in English, French and Japanese, provides an auditory description of Abbey's history. In examining self-guided visits, the aim is to understand how inclined visitors are to take advantage of interpretation boards and audio guides to shape their experience. Therefore, the percentage of visitors who opted to use interpretation methods and their visit intentions are further examined in Chapters 4 and 5.

As part of Stage 1, groups of visitors interested in a guided tour of the Abbey were also recruited. The guided tours were arranged as both English Heritage members' exclusive events and as a private group booking for participants of this study. The tour predominantly focused on 'The Decline and Fall of St Augustine's Abbey' on all occasions and was offered by the same person every time, Abbey Site Manager. Guided tour visits were examined in this study since they may unravel stories and additional layers of interpretation compared to self-guided visits (Ababneh, 2018).

By dividing experiences into self-guided and guide-tour visits, this study investigates the role of the tour guide on the overall visitation experience. The comparison between self-guided and guided tour visits intends to understand the role of the tour guide

(Ababneh, 2018) in interpreting and communicating information for visitors as well as delivering the guided tour. Evaluation of the guided tour allows unravelling the impact of guided interpretation on heritage experiences. This thesis examines the advantages and disadvantages of guided tour interpretation of the Abbey on site and identifies where improving guided interpretation could enhance visitor experiences and their making sense of the place. Additionally, a comparison between guided tours and self-guided visits facilitates understanding visitors' perspectives of a combination of interpretation methods. The analysis allows a better understanding of the type of information visitors seek from visiting the site and from the interpretation methods. The role of the tour guide is also questioned in interpreting in general, and specific to the theme of the tour, as well as engaging visitors who may have different historical knowledge, interests and expectations.

In both self-guided and guided-tour visit scenarios, visitors were provided with an opportunity to experience a VR recreation of the Abbey designed by the Kent School of Architecture and Planning (Griffin, 2020). The VR is developed based on the 16th-century state of the Abbey and visualises both the interior and exterior of the monastery before dissolution. The VR experience is offered through an Oculus Head Mounted Device (HMD). Experiential aspects of VR recreation are analysed in-depth in Chapter 5. The VR experience is separate from the self-guided and guided tour aspects of the visit. In the two previously mentioned experience modalities, the focus of the study is on visitors' understanding of the site, and artefacts and is based on their first-person observation of the site with additional interpretation elements where applicable. In the case of VR experiences, the study intends to examine the experience of visitors (or the VR viewer) when they are placed in a recreated historical environment, which is significantly distinctive from what they are able to observe in reality. With respect to this notion, this thesis explores how a VR and an in-person visitation experience of the same site may differ. Which one is more tangible and comprehensive in delivering informative and engaging experiences?

3.3.2 Why have different physical settings? - Stage 2

The previous section referred to Stage 1, where visitation experiences occurred in the conventional setting within Abbey's visitor centre and the grounds. Whilst the conventional settings offer diverse and multidimensional experiences, altering physical settings and thus diversifying the visitation experiences even further creates additional domains for exploration. Elaborating experiences may firstly attract broader visitor clusters (Barron and Leask, 2017; Leask, Fyall, and Barron, 2014; Veall, 2015) and secondly impact visitors' interpretation by showcasing the ruins and the artefacts in a different light.

Stage 2 events were organised to evaluate visitors' experiences in a physically altered heritage setting. Stage 2 had two differences from Stage 1. The events were held during night-time instead of daytime. Furthermore, projection displays of non-existent Abbey artefacts were installed among the archaeological ruins. Thus, at Stage 2, visitation experiences are examined from the perspective of a digitally enhanced and altered physical context. Having conventional visitor experiences evaluated at Stage 1, the second study questions the implications that night-time (and the dark) may have on the experiences. As Germain (2016) argues, night generates altered mental and physical perceptions of one's surrounding environment. Thus, Stage 2 focuses on the impact of visiting the site in the dark, intervening the ruins and their surrounding environments.

Similar to Stage 1, visitors' expectations were enquired to understand their vision of visiting the site in the dark and experiencing the digital reconstructions. Accordingly, Chapters 4 and 5 evaluate the consequences of altered physical settings on heritage experiences and visitors' making sense of the site. As digital reconstructions are placed among the Abbey ruins, Chapter 6 specifically discusses visitors' views around digital reconstructions of non-existent material artefacts, the degree of intervention in heritage settings and concerns for heritage preservation. From the experiences point of view, it is vital to obtain visitors' perception of incorporating digital technologies with historical ruins. Chapter 4 observes heritage experiences explicitly from the personal and physical contexts. The personal context elaborates on visitors' personal experiences with respect to their expectations, interests, and satisfaction. The physical context is employed to

understand experiences in heritage settings and the impact of digital interventions within the fabric of the site on heritage experiences.

3.3.3 Stage 2: Spatial Augmented Reality experiences

Following the previous section that justified the potential impact of interventions in a physically altered experience, this section discusses how these alterations were put in context as part of Stage 2. Stage 2 experiences at the Abbey were organised on four nights in November on the 20th, 25th, and 30th, and on December the 1st of 2019. The events were part of Stage 2 and exclusive to participants of this research study. Visitors were invited to book one-hour visits to:

1. Explore the Abbey grounds and ruins at night,
2. View site-specific digital interventions in projection format, and
3. Fill in a self-administered questionnaire reflecting on their visit once they have completed the experience.

All events took place in dark hours. However, as the grounds are located outdoors and are unroofed, weather conditions impacted the experiences of participants. Weather conditions also differed during the four events. The outside temperature was relatively similar across all events. However, on the 20th, the event took place with light drizzle. The variation of weather conditions during the events affected the projections' image qualities and visitor experiences in outdoor conditions. On the 25th, a clear sky meant that projections could be seen to their full potential. On the 30th, there was some fog, which, unlike the previous event, greatly reduced visibility. Eventually, on December the 1st, it rained while visitors were touring the grounds. The weather impact on experiences is further discussed in Chapters 6 and 7.

Stage 2 experiences were arranged so that visitors were welcomed at the main Abbey gate and registered to participate in the research study. A group of pre-informed volunteers were present at the Abbey entrance to receive the visitors. Each volunteer took a group of a maximum of five participants and accompanied them during their

visit. This was due to the fact that firstly, as the events took place in the dark, a guide with torches had to accompany visitors at all times to avoid hazards while walking among slippery ruins; and secondly, so that the visitor groups would see all three digital interventions on site in the same order. Figure 3.5 shows the path of the experience in the Abbey precincts where the digital interventions were installed. The first stop was the ruins of the Norman Church nave, where a holographic screen display of a nave column was presented. The second was the Chapel of Our Lady the Angels, where visitors could see reconstructed imageries of tile designs, and the third stop was the nearest accessible location next to the original Pièta graffiti onsite, where the graffiti was demonstrated in a lenticular display. Later in this chapter, Section 3.4 introduces and discusses the selection and creation of each individual display and the rationale behind them. Upon viewing the three displays, visitors were then taken to the data collection station in their groups to fill in a questionnaire.

1: St Augustine's Abbey entrance
2: Column base display at the Nave area
3: Medieval tiles display at the chapel of Our Lady the Angels
4: Pièta display
5: Data collection area

Figure 3.5: Experience path at Stage 2, St Augustine's Abbey, Canterbury

For this visitation experience, participants who were part of the first study were invited

to return to the Abbey to experience an altered and digitally-enhanced physical space. An additional group of visitors were also recruited who only participated at Stage 2. Stage 2 participants- as part of this study- experienced the Abbey with digital reconstructions within the fabric of the site. In general, the study sample divides into visitors who engaged with the study at Stage 1 only, visitors who took part at Stage 2 only and a group of visitors who were part of Stages 1 and 2. Chapter 4 further explains the demographics of Stages 1 and 2 and the visitor groups. Therefore, in terms of analysis, the study looks at the experiences of three major cohorts under different circumstances. This approach indented to:

1. Include a wider range of experiences that differ in interpreting heritage, guiding visitors on the site and visit modalities.
2. Allow comparative analysis of experiences of visitors who participate in one (either Stage 1 or 2) or both experience modalities.
3. Identify how Stages 1 and 2 experiences contribute to visitors' making sense of the Abbey and develop a model for heritage experiences onsite that reflects on the shared values and leverages the benefits of each of the experiences.

The model is drafted into a site-specific proposal presented in Chapter 7.

3.4 Digital reconstructions workflow

3.4.1 Selection of artefacts

This section explains the workflows for the digital reconstruction of the artefacts. The project workflow is based on the classification scheme proposed by (Münster, 2013; Münster, Hegel, and Kröber, 2016; Stiller and Wintergrün, 2016) that concerns the historical object and research context within an interdisciplinary practice of digital reconstruction.

Three artefacts from St Augustine's Abbey were selected for digital reconstruction for this project. They include a Norman column base, medieval tiles and a Pièta graffiti.

The Abbey, as discussed in Section 3.2.2, has seen many historical events and destructions. Thus, a significant number of its artefacts have either disappeared from the site or are in a fragmentary state. Therefore, as part of the digital reconstruction workflows, a number of artefacts that represented diverse qualities of the art and architecture that were once present at the Abbey, however, no longer exist on the site were selected. The selection of the three artefacts is inspired by the four degrees of authenticity - "design, materials, workmanship and setting"- as outlined in the 1977 version of the 'Operational Guidelines for the Implementation of World Heritage Convention' (UNESCO, 1977, paragraph 9).

Figure 3.6: Ruin of third Norman column from east to west at the nave area, St Augustine's Abbey, Canterbury

The reconstruction of the Norman column base is inspired by 'workmanship'. It intended to showcase a structural element of the Norman Abbey building, which is significantly demolished, and only its foundations remain on the site (Figure 3.6). The reconstruction aims to demonstrate Norman architecture, the use of material for structural elements and stone tooling. It aims to demonstrate the scale and height of the original Abbey in Norman times compared to the remains. The column base selected for reconstruction is the third among a string of columns stretching from east to west of the Nave on the south aisle of the Nave. The ruin foundation (Figure 3.6) remaining

on site measures 2.8 meters long and wide at most and has four sides. Whilst the two sides appear symmetrical, the sides on the inner and outer of the Nave are different in length.

This particular column base was selected for reconstruction because, in terms of the location, it is in front of the standing north wall of the Nave. Standing on the south side of the column base, the viewer can see a very well conserved example of Norman stones and tooling. Hence, the reconstruction and in-situ display of this particular column base aid visitors compare the computer-generated imagery of the texture and tooling of the Norman structure with a standing example in front of it. In Chapter 6, a discussion comparing remaining relics and reconstructed counterparts explores the impact of resemblance on perceived authenticity and realism.

In addition, on the east and west side of the selected column base remain other column bases, each demolished to a certain degree. Similarly, a comparison between the scale and the dimensions of the remaining column bases with the digital counterpart is employed in Chapter 5 to understand its impact on envisioning the site's grandeur.

Figure 3.7: Re-laid medieval tiles at the Chapel of Our Lady the Angels, St Augustine's Abbey, Canterbury

The reconstruction of the medieval tiles reflects on 'material' and 'design' attributes of authenticity. The medieval tiles currently on display at the chapel of Our Lady the Angels (Figure 3.7) are a combination of floor tile works which originally belonged to different parts of the Abbey and were later re-laid in the chapel (Sherlock and Woods, 1988). The reconstruction of the tiles visualises multiple tile patterns and designs that incompletely remain onsite. It includes a sixteen-tile pattern design with grotesques,

winged monsters and eight-palleted daisies within circles and between double arches. Figure 3.8 presents tiles 28, 29 and 30 as in the excavation reports, which are considered to belong to one pattern design. A sample of tile 28 can be identified at the Abbey. The 16-tile pattern is a 4 x 4 square. Tiles 28 and 29 belong to the outer grid, and tile 30 is from the centrepiece. The tiles are 118 mm square and 23 mm thick and produced in the Tyler Hill workshop locally in Canterbury. Similar findings have been discovered in the excavation of the Hospital of St Mary of Ospringe, which date these tiles to the early fourteenth century (Smith, 1979). A reconstruction based on evidence of similar tiles in St Mary Brook Church (Pallett, 2011) accordingly suggests that the three tiles excavated at St Augustine's Abbey form a sixteen-tile pattern. The pavement at St Mary Church Brook (Pallett, 2011) remains in its original form, including a display of the sixteenth- tile pattern in question.

Additionally, a continuous geometric design from several samples present at the Abbey was selected for reconstruction. The tiles are square-shaped with 111 mm in length and 19 mm in thickness. They are found in great concentration in Sussex and Kent. However, they are also seen in other parts of the UK, such as St Mary's Abbey, York or Muchelney Abbey, and Somerset (Sherlock and Woods, 1988).

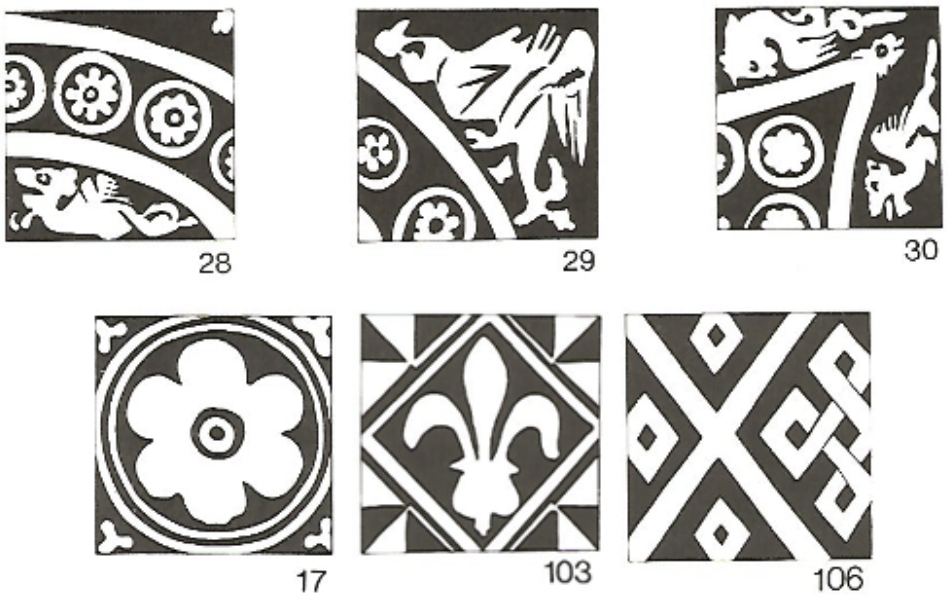


Figure 3.8: Excavated tiles at St Augustine's Abbey (Sherlock and Woods, 1988) - Copyright: Courtesy of Kent Archaeological Society

Two forms of single decorated tiles, also present in the tile display at the chapel, were additionally nominated for reconstruction. Multiple samples of tiles 17, 103 and 106, as labelled on the excavation reports, were discovered at the Abbey. Tiles 103 and 106 were produced in France and are categorised as the Lewes Group. Tile 17 is a daisy with six petals with double borders and trefoils, also produced in Tyler Hill Workshops. In general, the reconstruction of the selected single and pattern tiles aimed to showcase a complete standalone image of each of the designs.

The selection of these medieval tiles intends to reference the variety of designs and materials used in creating the tiles medieval at times. The Abbey's visitor centre houses some excavated tiles and provides historical interpretation along with the displays. In addition, some tiles, as explained above and shown in Fig 3.7, that belonged to different locations of the historic Abbey have been re-laid at the Chapel. The current arrangement of the tiles does not showcase design patterns and placements of the tiles in relation to one another in a particular pattern. Therefore, the digital reconstruction of the tiles intended to recreate patterns and single decorative tiles. It aimed to visually interpret the context of the whole. The reconstructions show completed tile patterns to demonstrate how one element contributes to a more comprehensive design of medieval arts.

The third reconstruction is the Pièta graffito engraved on Caen stone. The Pièta was only discovered during the 1960-78 excavations of the site (Sherlock and Woods, 1988). Evidence of a variety of graffito in English churches includes compass-drawn designs, mason marks, figurative and many more (Champion, 2015). The graffito discovered at St Augustine's Abbey is visible on three blocks of Caen stone (Figure 3.9). The engraving is associated with Pièta as it depicts the scene of the Virgin Mary who cradles Jesus Christ. The third persona in tears, presumably St John, is identifiable on the left side of the engraving (Sherlock and Woods, 1988). However, as reported in the excavation reports, marks on stone blocks adjacent to the three central blocks demonstrate that the graffito included a bigger composition. The stone blocks are worn away. Traces of the graffito can be seen on three blocks of stones but not further than that. The Last Supper engraving (Figure 3.10), located in the crypt of Rochester Cathedral, formerly Priory of St Andrew (Scott, 2018), is considered to be closest to

the graffito at St Augustine's Abbey.

Medieval graffito is widely discovered in historical sites and, in particular, in churches and places of worship. It can range from trademarks and symbols to figures of prominent historical or religious characters. In addition, it has been used as a medium to record and narrate events or personas on stones visually. St Augustine's Abbey is no exception to medieval graffiti. Although solely the Pièta Graffito has been identified in the excavation reports. The selection of the Pièta graffito reflects that, firstly, no other similar design can be discovered in the Abbey. Hence, it is the only example for visitors to be introduced to medieval graffiti and the theme and content of the engraving. Secondly, as the original precincts of the Abbey lie in the current precincts of the King's School, the engraving is not accessible to English Heritage visitors. Hence, displaying a reconstructed image of the engraving as part of this research unravels an additional channel of information not employed in the conventional interpretation of the site.

Figure 3.9: Marks of the Pièta graffiti, St Augustine's Abbey, Canterbury

Figure 3.10: Thirteenth-century figurative graffito possibly representing a condensed Last Supper (Scott, 2018) - Copyright: Kent Archaeological Society

3.4.2 Data acquisition

The digital reconstruction workflows employed in this project are based on the integrated methodology proposed by Guidi, Russo, and Angheleddu (2013) for the digital reconstruction of archaeological sites using 3D documentation and historical and archaeological references. This methodology has been applied to the MySon site (WHS), Vietnam and leads to creating a reality-based reconstruction of the archaeological ruins. This section explains methods used in data acquisition, both historical and computational, 3D modelling and digital painting to create digital reconstructions of artefacts introduced in Section 3.4.1.

The artefacts selected for reconstruction are in a fragmented or destructed state. Therefore, a comprehensive data acquisition of the artefacts' design, forms and materials required field observation of the ruins, surveying similar structures from the same historical era presenting relevant or similar qualities and searching archives and collections. The process and inclusion of data acquisition varied depending on the nominated artefact case.

The column base ruin, although significantly demolished, was considered a starting point for the reconstruction process. The physical attributes of the column were obtained by surveying its geometrical dimensions. However, as the column base is significantly demolished, data on the height, structural design and building material could not be obtained by direct observation of the ruin. Hence, surveying historical structures with similar Romanesque styles, such as the Nave columns and pillars at the Rochester and Canterbury Cathedrals, helped envisioning the Norman column better. The data acquisition benefited from illustrations on the site published by English Heritage and many other examples from British Museum on English monasteries and churches.

A 3D photogrammetry of the column base was conducted to obtain a digitised 3D model of the ruin as it stands today. 3D scanning and photogrammetry (Barazzetti et al., 2011; Remondino, 2011; Wachowiak and Karas, 2009) are commonly used in archaeology and heritage research. In the case of the column base, due to the scale and its fixed position, photogrammetry was employed to record images and create a 3D model. Fifty-two images taken from 360 degrees around the ruin and above shaped the basis for 3D photogrammetry. The images were subsequently manipulated in Autodesk ReCap, which generates 3D models from imageries. Therefore, a high poly 3D mesh of the ruin (Figure 3.11), including texture maps built from images, was executed. The 3D photogrammetry aids in accurately building the rest of the geometric structure around a simple base. This method was applied early in the research process to gather substantial digitised material on the existing relics.

The photogrammetric reconstruction of the Buddhas of Bamiyan (Grün, Remondino, and Zhang, 2004) demolished by the Taliban also benefited from image-based and point cloud generation. Similarly, laser scanning and 3D modelling were also employed in the reconstruction of the sculptural figures of the east pediment of the temple of Zeus at Olympia (Patay-Horváth, 2014).

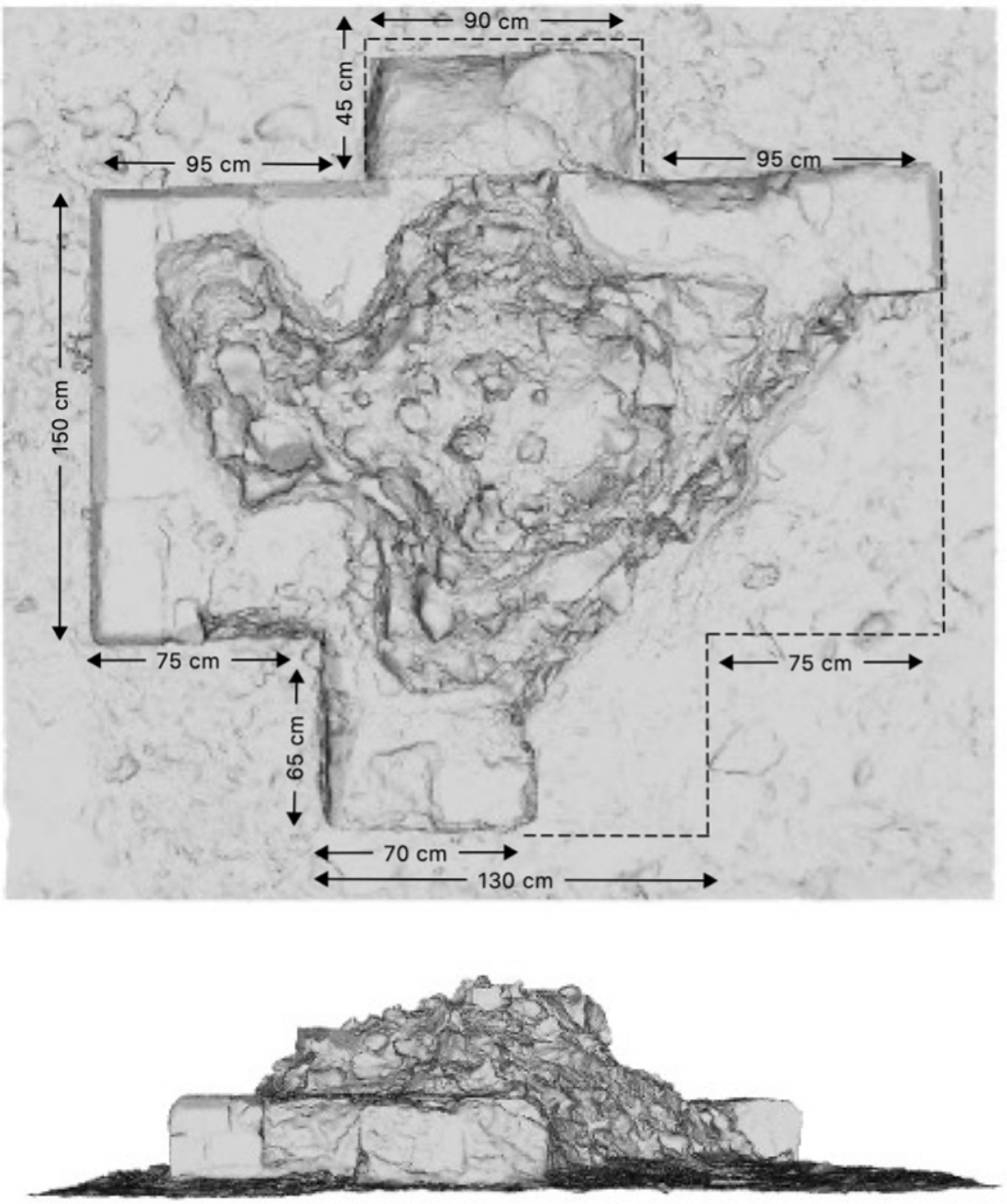


Figure 3.11: Top and front views of 3D photogrammetry mesh

Acquisition of historical data for the medieval tiles involved studying the excavation report that explains the making, the style, and the aesthetic attributes of the medieval tiles in great detail. Additionally, samples from excavations which are housed in the English Heritage collection at Dover Castle and Abbey's visitor centre were surveyed to gather further details about the tiles' pigment.

3.4.3 Digital designs

The reconstruction of the nave column was executed in Autodesk Maya. A 3D model of the column was built using the dimensions acquired from the photogrammetry mesh. The reconstructed model stands on a column base. The model includes the central pillar that stretches in half pillars on all four sides. The two pillars on the sides are designed symmetrically. However, the pillars facing north and south vary in scale. The north side is narrower, and the south side is wider. Two single pillars are also placed on the south side on either side of the main pillar. The lower section of the pillar is decorated with stone tooling, in the same style, as evident on the remaining relics on the north aisle wall of the nave, which stands today. The column model also includes tooling where the joints of Caen stone placement would have appeared in a row. A texture file of Caen stone, as it appears at the Abbey, was used as the main colour. The same texture was also used to add 3D depth to the stone, including bulges and dents between the blocks and on their surface.

Figure 3.12: 3D render of the Norman column reconstruction

The digital reconstruction of the medieval tiles and the Pièta were executed by digital drawings using a digital pen in Autodesk Sketchbook. Initially, tile design templates were drawn on the individual tile's original layout arrangement. Later geometrical designs and motives were added accordingly. Figure 3.13 demonstrates procedural

steps to create the sixteen-tile design, which also applied to other imageries. Lastly, the designs were coloured based on corresponding tile pigments observed in excavated samples.

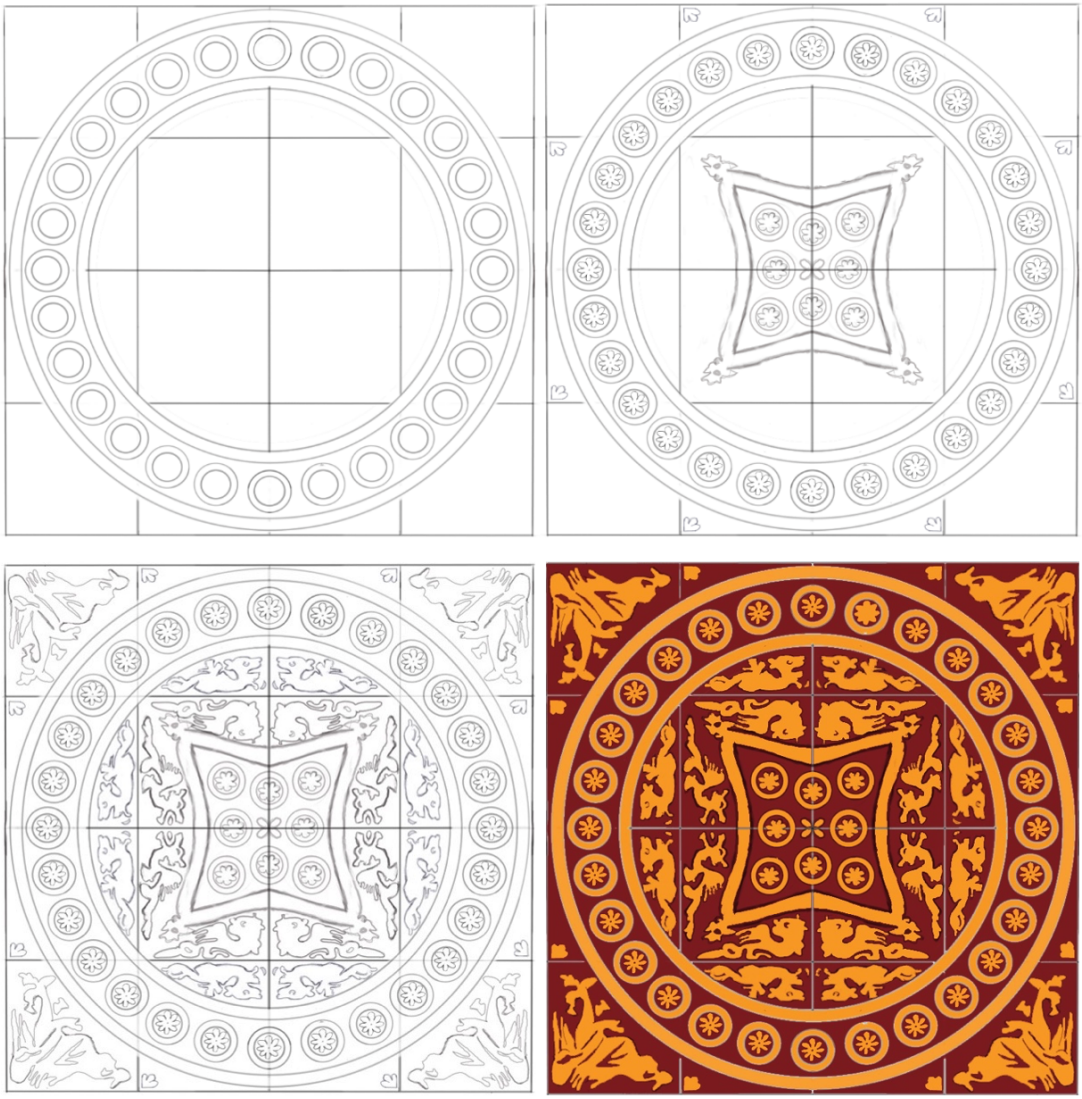
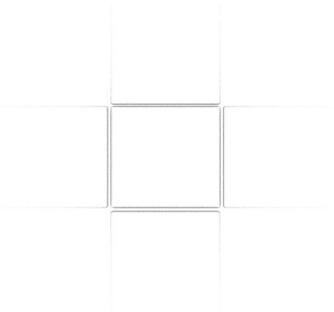
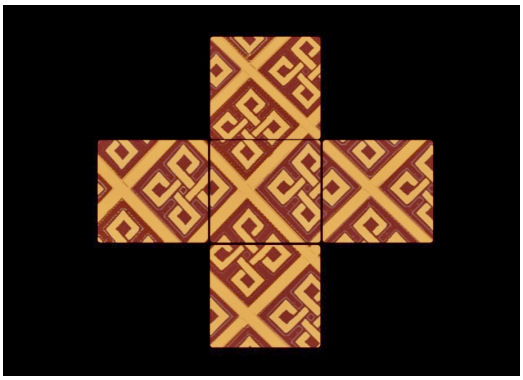


Figure 3.13: Demonstration of procedural process in the digital drawing of 16-pattern medieval tiles

In the case of Pièta, the image of the remaining marks on the wall was considered a starting point. Similar to the style shown in Figure 3.13, graffito figures were drawn to recreate the image in Autodesk Sketchbook. The drawings of the tiles and Pièta were used as textures files only and were then assigned to corresponding 3D models in Maya, from which subsequent render passes of Ambient Occlusion, Diffuse Albedo, Diffuse and Specular were generated in HD 1080 quality. The render passes were ultimately composited in Adobe After Effects to create the final reconstructed imageries.

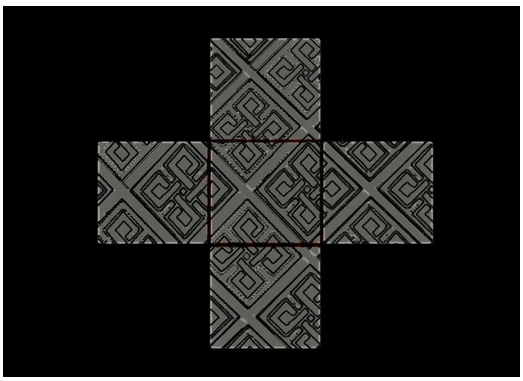


Ambient Occlusion



Diffuse Albedo

Diffuse



Specular

Figure 3.14: Render passes used for digital textures

3.4.4 Projection display specifications

The three projections were distinct in their installation and fabrication. A health and safety assessment by the University of Kent ensured that the equipment used in the display was fit and that the arrangements did not cause hazards to the individuals present onsite. Another health and safety assessment by English Heritage measured the risks of the particular events with concerns about visitors on site in the dark and the Abbey ruins.

The nave column base projection setup included a photography backdrop which was 3m wide and 2m tall. The backdrop was positioned on the south side of the nominated column base. According to the conservation strategies of the site, no pols could be fixed in the ground. Therefore, the backdrop legs were stabilised with three heavily loaded sandbags on each leg to avoid collapses in windy conditions. A net fabric was selected for the projection as it appeared transparent in the dark. Hence, the projection emulated a holographic image as the digital reconstruction of the column

projected appeared floating in the air. It was hung from the top pol of the backdrop and stabilised using gear clips on each side from top to bottom. A SANYO PLC XU-70 projector was placed around 2 meters behind the projection fabric. The projector and computer were powered from the visitor centre through extension cables.

The display of the medieval tiles at the chapel of Our Lady the Angels was installed in a much simple fashion compared to the nave. An Elephas portable projector 1080 HD resolution was mounted on a Manfrotto camera tripod. The projector aimed at the remaining tile relics. Therefore, the reconstructed imageries were directly shown on the selected tiles and, where applicable, showcased a completed pattern. The reconstructed images were saved on an SD card directly loaded onto the projector. A Goal Zero Yeti 1000 Lithium portable power station supplied electricity to the display.

The projection of Pièta (Figure 3.15) was designed partially similar to both the nave and the tiles. Similar to the nave display, a photography backdrop was used to hang the fabric. The display was, however, much smaller in scale and measured 0.5 m tall and 1 m wide. The fabric used in this display was a 'Pepper scrim' manufactured by ShowTex, which also created a holographic effect. However, in the case of this display, the fabric was manipulated into eight lenticular panels using wireframes on the top and bottom of the fabric. The panels each were 12 cm wide and 60 degrees apart to allow an excess of 5 cm on each side of the fabric for clipping to the backdrop. 4 cm was considered as a contingency at folding. The reconstructed imageries were mapped onto the fabric in a way that panels looking to one side showcased the stones as they are now, and the panels facing in the other direction displayed stones with recreated marks of the Pièta graffiti.

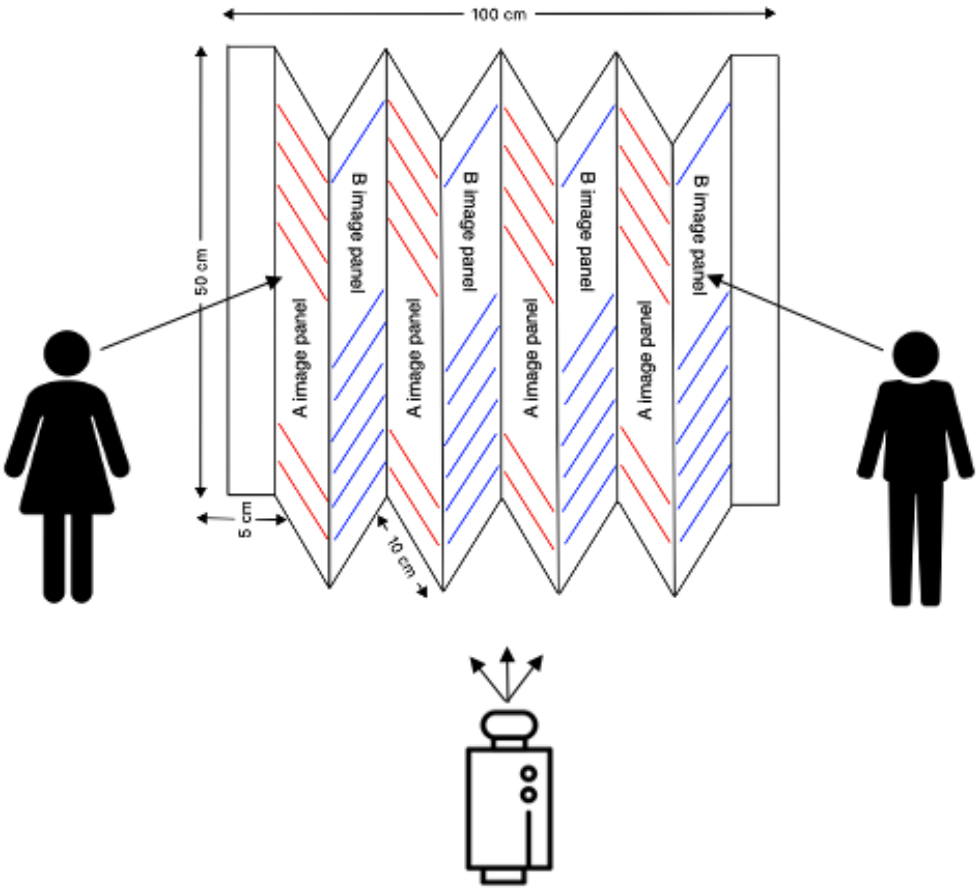


Figure 3.15: Diagram of the lenticular projection display

3.5 Data sets/Themes in the questionnaires

3.5.1 Questionnaire design

The research was given ethics clearance by University of Kent Ethics Advisory Group upon reviewing the research proposal, risks and ethical issues, recruitment and consent, confidentiality, incentives, publication and dissemination of the information gathered.

The questionnaires (appendices C and F) were designed to gather data for this qualitative research. They consist of different themes and question typologies which are discussed in the following sections. The main approach employed for data collection was qualitative. However, as it is widely practised, combining qualitative and quantitative methods (Bryman, 2006) is incorporated in this research where relevant. Morgan's (1998) approach in combing qualitative and quantitative methods is employed on a

varying scale. Hereby, the methodology is based on complementary methods in which a principle qualitative approach is supported by a complementary qualitative method. This general approach values the importance and contribution of both methods whilst prioritising them in sequence based on research purposes. By doing so, it was intended to reflect on 'expansion' within Greene, Caracelli, and Graham's (1989) conceptual framework for mixed-method evaluations. Expansion is commonly demonstrated in qualitative evaluation of processes and quantitative evaluation of outcomes. This is due to the fact that merely qualitative or quantitative information cannot be employed to draw comprehensive conclusions. This approach is mainly employed in the evaluation of technology for heritage (Chapter 5) in a number of cases.

However, as Brannen (2005) explains, incorporating the two methods can result in various evaluation methods. In addition to the complementarity of the qualitative and quantitative approaches explained above, 'elaboration' is critical in this research. Elaboration is contextualised by Brannen (2005) as a method to explain quantitative findings by providing qualitative examples. Chapter 6 uses elaboration to draw conclusions from qualitative data on theoretical subjects such as authenticity and realism collected at Stage 1 to justify statistical data gathered on the two notions at Stage 2.

The types of questions incorporated in the questionnaires vary based on the enquiry purposes and intended data gathering. Both questionnaires at Stage 1 and 2 included multiple themes (discussed in the following sections) that govern thematic questions in particular sections. In both cases, single select multiple-choice questions are included to obtain social-demographic information about the participants of the study. A number of Yes/No questions followed by an antecedent question are used to evaluate circumstances and enquire further explanations depending on the respondents' primary answer to the question. Short answer questions are included to identify key themes in both questionnaires. However, long answer questions compose the mass body of the questionnaires. They are posed as open-ended questions in order to obtain information from visitors' perspectives and perceptions on multiple themes. A nine-point Likert scale is used on multiple occasions to enquire about hedonic questions on the easiness, quality and advantages of the technologies included in both Stage 1 and 2. The Likert scale embodies points varying from 1 (lowest) to 5 (moderate) and to 9 (highest).

3.5.2 Demographic profiles of samples

The samples acquired at Stage 1 and 2 are generated from diverse social-demographic attributes. The call for participant recruitment was sent to large groups of population in the County of Kent to ensure an inclusive sample of gender, age, and background. An open call for participant recruitment was sent to the University of Kent's students and staff, Kent Centre for Heritage, Kent Adult Research Unit, English Heritage members, staff and volunteers, The University for the Third Age (U3A) and Canterbury Archaeology Trust and received interest from all groups. The call for participants intended to reach prospective visitors to the Abbey from diverse backgrounds and interests. This is due to ensure heritage experiences are evaluated considering wide social-demographic and visitor profiles that the Abbey receives on daily basis.

Both Stages 1 and 2 questionnaires included questions about visitor profiles to obtain primary data about participants. By posing these questions, the aim was to understand which gender or age groups were most or least interested in visiting the site. Chapter 4 employs such data to examine visitor experiences in various modalities. For example, which age group is more likely to visit a heritage site? How likely is it that different social demographics visit a site on their own or attend a guided tour? Consequently, which visitation mode best appeals to the interest of which visitor cluster?

However, demographic information gathered from participants is not limited to common attributes. In order to obtain specific and efficient demographic information from visitors, particularly in relation to heritage visits, the questionnaires included further questions on the distribution of local and non-local visitors, the annual frequency of heritage visits and English Heritage membership. Enquiry about the town of residence aimed to investigate how many residents within the City of Canterbury and, more broadly, Kent County are interested in visiting a local World Heritage Site. The study aimed to further understand visitation experiences by enquiring about the characteristic attributes of the visitors. In the analysis, combining data obtained from a number of demographic enquiries on visitor profiles is commonly employed to observe visitation experiences of focus groups who share at least one attribute.

3.5.3 Visitor experiences

3.5.3.1 Intentions to visit

This study is based on the Dierking and Falk (1992) Interactive Experience Model. As discussed in Chapter 2, the value of an experience is not limited to the experience itself. What happens pre- and post-experience influences the whole visitation process. Therefore, to evaluate experiences at St Augustine's Abbey, and enquire about different dimensions of experiences, this study also posed questions about visitors' prior knowledge of the site. The Stage 1 questionnaire asks:

- How many times have you visited St Augustine's Abbey? If this is not your first visit what made you to come back?

These two questions aimed to categorise visitors into first time and returning visitors for analysis purposes. Moreover, the questions enquire about visitors' intentions in revising a heritage site (Hamid, Mohamad, and Suki, 2020). These questions were posed with the intention of learning whether sense of place and place attachment (Abou-Shouk et al., 2018) are common factors for visitors to the Abbey to revisit; or, in the case of the returning visitors, does the previous experience flow (Chen et al., 2017) trigger revisit intentions?

In addition to previous visits, a heritage experience can also be simulated by some primary knowledge obtained before the experience. Hence, the first questionnaire enquires about visitors' initial familiarity and awareness of the Abbey by asking:

- Did you look up the site prior to your visit? If yes, please describe how and why you looked up the site beforehand.

The question aimed to, firstly, examine the contribution of having prior knowledge about the site plays on experiences and, secondly, whether visitation qualities vary depending on having gained information beforehand or not. Through the different experience modalities, visitors were informed about the Abbey through multiple channels, as offered by the visitor centre and the grounds. The question above on methods visitors use to obtain information about the site intends to understand how and to which

capacity visitors enquire about historical and archaeological subjects.

3.5.3.2 Expectations in relation to experiences

Chapter 2 discusses visitor expectations at heritage sites in detail. Accordingly, probing visitor expectations is key in this study. However, as much as expectations are studied to understand experiences in general terms, enquiries about expectations are different depending on the circumstances of the visit. The Stage 1 questionnaire asks about visitors' general expectations by simply asking visitors to explain what they expected to encounter during their visit on that day. Two justifications stand in probing visitor expectations.

The first intends to gather information about visitors' different expectations from a conventional heritage experience. The information obtained is used in Chapter 4 to analyse how visitors on different visitation modes (self-guided/guided-tour, 1st-time/returning) may have different expectations when visiting the same site. The same question is posed at Stage 2 to enquire about visitors' expectations. By posing this question, it is intended to understand the public's perception of visiting a heritage site during dark hours and also enquire about visitors' understanding of digitally enhanced experiences prior to encountering them. The invitation letter sent to participants' at Stage 2 included specific terminologies such as 'reconstruction', 'digital arts', and 'intervention'. Having presented these terms to participants before their visit, the question above intends to understand how visitor expectations related to digital technologies, particularly with the notions introduced in the invite. The second question below aims to employ expectations in order to analyse experiences. Thus, both questionnaires at Stage 1 and 2 enquire about visitors' heritage experiences at St Augustine's Abbey by asking visitors to:

- Stage 1: Please compare your experience with your initial expectations of the site.

- Stage 2: Please compare your experience with your initial expectations of it?

Hereby, it is aimed to obtain an understanding of expectations and experiences directly

from visitors. These questions intend to gather information on whether the realised experiences were in line with visitor expectations. How were the expectations and experiences similar? In case of, and if so, what did the experience provide to fulfil a variety of visitor expectations? Ultimately, this section enquires about visitors' satisfaction and experience quality (De Rojas and Camarero, 2008; Wu and Li, 2017). In the case of Stage 1, the comparison between expectations and experiences is observed from the visitors' personal interpretation of the site. However, in the case of Stage 2, the emphasis is on unconventional physical settings and an innovative layout design to trigger diverse experiences (Bonn et al., 2007) in a heritage context. Whilst Stage 2 compares expectations and experiences from personal and physical perspectives, a combined analysis of Stage 1 and 2 intends to investigate visitor expectations and experiences in a broader context.

3.5.3.3 Communication of information

Lastly, on the experiences, the questionnaires reflect on the role of cultural heritage interpretation methods in providing visitors with information about the displays. Objects in cultural heritage museums are core in this section. Stage 1 enquires about presentation of archaeological artefacts at the visitor centre and the Abbey grounds as well strategies used in introducing them. The questionnaire asks:

- Does the current display provide sufficient information about the history of the site?

This question particularly investigates the role of the display arrangement, including the selection of artefacts and design layout, in providing information about the individual objects and interpreting them for visitors to comprehend the relationship between artefacts and the site in a broader context. Therefore, it also enquires about visitors' perception of the interpretation and storytelling approaches (Nielsen, 2017) that the Abbey offers in delivering information through displays of artefacts.

The following question on the role of display in interpreting the Abbey for the visitors asks if historical eras and events are portrayed within the displays.

- In your opinion, does the current display accurately convey the history of the site?

This question aims to understand whether visitors observe historical objects in the visitor centre on their own or interpret them as part of continued historical development concerning materiality, age, and decay. It also aims to obtain information about the notions that are most important to visitors in observing displays of artefacts to acquire knowledge, including historical era, style and design, make and function.

Similarly, the Stage 2 questionnaire included questions on the displays. However, as the experience occurred in altered physical settings, the nature of the enquiries was shifted towards the digital installation on site. The question:

- How do you find digital creative interventions as such in a heritage context?

aims to gather visitors' points of view on the integration of digital media in a historical context. It intends to understand whether visitors find digital installations appropriate for the heritage fabric of the site. This question examines how visitors negotiate the appropriateness of intervention and their views, and to what extent notions such as aesthetics and authenticity drive their viewpoints.

The following question,

- Do you think the projections have given the previous display additional informative values?

further elaborates on the impact of the digital installation on the experience of visitors. It is posed to gather information on the displays' role in communicating historical information to visitors through digital visualisations. This question is relevant to visitors who participated at both Stage 1 and 2.

3.5.4 Technology for Heritage/Visitor Engagement

3.5.4.1 Audio-visual devices

The two questionnaires enquire about visitors' observation of the site and the input of audio-visual implements in their observations. This section refers to the VR and audio-guide technologies offered at Stage 1. The following section refers to the projection displays displayed at Stage 2. The questionnaire offered at Stage 1 specifically enquires about the impact of VR and audio guides on visitor experiences where applicable.

- Did you use the Virtual Reality headsets? Please rate how immersive do you think Virtual Reality is on the scale of 1-9.

A combination of long answer questions and a Likert scale rating intend to gather general information on how visitors find themselves immersed in a VR recreation of the Abbey after experiencing the physical ruins. It aims to understand to what extent a VR recreation conveys a sense of place (Relph, 2007) and appears believable to the viewer (Heeter, 1992; Luciani et al., 2004). Hereby, it is questioned if the VR recreation includes referential elements that can immerse the viewer further into the historic Abbey.

The questionnaire also emphasises on the ease of navigation in a virtual environment by asking:

- How easy was it for you to look around the Abbey in VR space using the headsets?

This question intends to understand viewers' proficiency and comfort in observing the site in VR. It reflects on the embedded gaze detection and walking simulation (Nielsen, 2017) methods incorporated in the VR for the viewer to move from one environment to another. Ultimately the question:

- In your opinion, does the VR provide good quality information about the Abbey?

enquires about VR as a technology aid designed for demonstrating the historic Abbey. This question aims to understand visitors' perception on the static and interactive

elements embedded in the VR, the aesthetics of visual information incorporated as well as historical credibility. Thus, following the two previous questions, it enquires about multiple domains with the VR environment that shape and impact the VR experience for the user. Chapter 5 Sections 5.2 and 5.3 respectively discuss heritage experiences with audio-guides, immersion, interaction quality and VR experience outcome.

Concerning audio guides relevant to self-guided visitors, the questionnaire at Stage 1 asks:

- Did you use the audio guide whilst exploring the site? If yes, did it provide you with useful information about the site?

This question intends to learn which group of visitors, considering social demographics and expectations, are most interested in using an audio guide whilst visiting the site. The enquiry examines the user experience of the audio guide in general. Although, it particularly observes the accessibility of communication methods in museums (Ruiz et al., 2011) through audio narration in addition to the existing channels in the visitor centre and on the Abbey grounds. It examines the audio guide's mode of delivery as a location-based guide (Wacker et al., 2016) designed for multiple hotspots on the Abbey site. It focuses on visitors, the experience of technology-led guided walk (Fitzgerald, Taylor, and Craven, 2013), route mapping and guidance on what to see.

Lastly, using a nine-point Likert scale, the questionnaire enquires about the overall impact of the use of technology, either VR or audio guide, as applicable. The information gathered here further supports the analysis of the data gathered in previous questions on technology-aided experiences.

- Overall, please explain how the use of technology was beneficial for you today? Please rate how beneficial the use of technology was for you today.

3.5.4.2 Visualisations

Ultimately, the impact of visualisations on any visitation mode is enquired. The Stage 1 questionnaire included:

- To what extend does visual information influence your understanding or interpretation of the site? Please describe why.

- Please explain the ways you observed the ruins today.

- Would digital and creative installations in the ruins influence your engagement with the site? If so, would this influence be positive or negative?

These questions aim to gather information on visitors' perception of visual information and communication methods and the engagement factor. The questions pursue common concepts on the integration of digital visualisations in heritage and historical contexts. They are, therefore, posed during Stage 1 to firstly identify visitor observation methods and secondly attain the extent to which sight and visual information are incorporated in observations.

The Stage 2 questionnaire enquired about the engagement factor of projection installation. Questions include:

- Please explain how engaging you find the projections.

- Can you explain the impact of the projections on your experience of the Abbey today? Was it positive or negative and why?

The two questions above predominantly investigate the impact of imagery projections on experiences through personal and physical channels. On the personal, they enquire about how visitors can find projections as visual aids in perceiving information about the site in combination with the ruins. On the physical, they enquire about visitors' perspectives on the projections as an addition to the site. Therefore, the emphasis is on whether influencing the environment with projections is counted as engaging or simulating. Overall, the function, aesthetics and content delivery of projects are observed through these questions.

Lastly, the questions:

- Do you prefer to see visual information in Virtual Reality or in Situ (augmented reality)? Please explain why.

- In comparison with the Virtual Reality, how favourable is the image quality of the projections?

ask visitors to compare VR with AR. Following questions about the VR, this enquiry aims to understand the general perception of different modes of delivering visualisation. It particularly looks for opinions on the advantages and disadvantages of both VR and AR, including distraction from the physical environment, the essence of the interventions and harmonisation of digital visualisations with physical counterparts. Analysis of the question above is aided by similar relevant information gathered from previous questions in section 3.5.4.1. This question only applies to participants involved at Stage 1 and 2.

3.5.5 Views on authenticity and realism

A series of questions on thematic notions of authenticity and realism posed at Stages 1 and 2 enquire about participants' perception of the terms in relation to material heritage and their digital counterparts.

- Do you think digital reconstructed imageries can be authentic? Please explain.

The question above intends to understand the public's understanding of authenticity; in what context is authenticity perceived? and how the perception of authenticity extends to digital recreations of the historical authentics?

The question: *"Do you think projections are real? Please explain."* enquires the nature of projections. It aims to gather data on qualities participants associate with realism and hyperrealism. By posing this question, it is intended to understand whether the immateriality of the projections (or projected contents) impact participants' perception and drives the perception of an illusion.

- Would you like to see digital art interventions on heritage sites providing that they do not damage the site? If any, what type of interventions can you think of?

The questionnaire at Stage 2 reflects on authenticity and realism differently. As participants had already encountered digital intervention on the site, the questionnaire

asks if and how authenticity was perceived. This enquiry aims to gather information on authenticity in relation to the interventions, to examine if the interventions have manipulated the authenticity of the site and whether an experience of heritage with altered physical settings is perceived as authentic at all. The question asks:

- *Do you think the experience was authentic?*

Further on realism, the questionnaire at Stage 2 enquires about perception of reality by asking visitors to justify the projection displays as real or hyperreal. Hereby, it is aimed to understand the qualities found in the projections that would define them as real or hyperreal.

- *Please explain how you describe the projection; Real or hyperreal?*

The last series of questions in the second questionnaire were presented in a Likert Scale format. They enquire about the authenticity, realism, image quality and visual fatigue of each of the three displays. By questioning the four attributes, it is aimed to understand how each element is seen individually and how it correlates with others. For example, whether a highly perceived authentic recreation is also considered as real or does the image quality of the display manipulate participants' perception of realism?

3.5.6 Content analysis

This section reflects on the content analysis for organising the qualitative data gathered from questionnaires at Stages 1 and 2 using Nvivo. It expands on the process of managing and interpreting data through five steps:

1) Transcribing data: A word document was created for each questionnaire completed by participants of this study at both Stage 1 and 2. Participants answers were transcribed and saved on digital copies of the survey samples.

2) Migrating data to Nvivo: Digital copies of the questionnaire were imported into Nvivo. A case was created for each participant. The files were then organised into different classifications such as:
- Stage 1, Stage 2 and Stage 1 & 2 visitors

- Age groups
- Audio guide users
- VR users

3) Coding frameworks: A number of coding methods were used in analysing data depending on the query and the objective of posing the question to visitors. The codes were created at different levels as explained below to ensure credibility and validity of information and insights.

Codes for questions: At the first instance, and in order to gain an overview of the data, a code was created for each survey question. Information provided by participants for each question was then stored in one category. For example, a code for visitors' expectations at Stage 1 held all the data in relation to this enquiry from the sample population.

Codes for a group of questions: Following organising data for each question, a broader approach was taken to review the data gathered in relation to questions under the same theme(s) of the questionnaires. For example, responses provided for questions presented in section 3.5.3.3 were grouped into one code which contained information about visitors' views on the interpretation provided at St Augustine's Abbey.

Codes for words: A number of codes were created to identify and store information in relation to the keyword and the surrounding themes. For example, a code for 'engagement factor' for projection displays at Stage 2 contained all information about whether, to what extent and how visitors found the projections engaging.

4) Analysing data using codes: Following creating a coding framework, the data were analysed by exploring how cases and file classifications responded to different questions on the surveys, revealing themes and narratives associated with the enquiries. Three primary methods were used to analyse data in Nvivo.

Enquiring codes: The 'Queries' function in Nvivo was used to identify responses to a code which allowed filtering and selecting different files and codes. For example, this feature was used to filter responses to expectations and experiences at Stages 1 and 2 to understand similarities and differences. Such analysis supported understanding

visitors' satisfaction which is later discussed in Chapter 4.

Creating word clouds: Using the codes, word clouds were created to identify keywords participants provided in relation to the question a or a notion. For example, a word cloud on how visitors observed the site at Stage 1 has supported identifying key and most repeated approaches by visitors. Such analysis is used for understanding visitors how visitors define and negotiate authenticity and realism.

Creating word trees: Word frequency search was used to create word trees which supported identifying keywords that participants used in providing answers to a question. Word tree branches supported identifying the relationship between responses and linage of information for further analysis. For example, creating word trees was used to classify responses provided for VR ease of navigation into three categories of easy, moderately easy and challenging (Chapter 5, Section 5.3.1).

5) Drawing conclusions: The coding frameworks and enquiries were employed to gather insights and draw conclusions which are later presented in Chapters 4, 5 and 6.

3.6 Conclusion

This chapter explained the methodologies in this research project. It justified the intentions behind selecting St Augustine's Abbey as the research site due to it being part of a World Heritage Site and significantly demolished over the span of time; the two principles which motivate this research to be based on heritage experiences and incorporating digital reconstruction in historical and archaeological contexts.

It discussed the experience modalities evaluated later in this thesis, including conventional heritage experiences offered by English Heritage (Stage 1) and Spatial Augmented Reality experiences (Stage 2) arranged exclusively as part of this research. It drew on Stage 1 heritage experience dimensions such as self-guided, guided-tour, VR and audio guide enhanced. It presented hypotheses on how the aesthetics of altered physical settings in heritage sites may influence visitors' perception of the site in the dark. Furthermore, it explained the data collection sessions for evaluation of visitor experiences

by referring to the questionnaire themes, including the participants' social demographics, visitor expectations and experiences, visitor engagement with artefact display and technology, and lastly, perceived authenticity and realism considering digital interventions in historical contexts.

Later this chapter drew on the practical workflows incorporated in the digital reconstruction of the artefacts. It contextualised the importance of showcasing reconstructions of a variety of artefacts that contributed to the art and architecture of the Abbey in the medieval and Anglo-Norman eras. Further on, it discussed data acquisition for the selected artefacts, which involved observing archaeological ruins, surveying archival material, and obtaining 3D acquisition of the remaining relics. The last sections discussed the digital designs of the selected artefacts, mainly using Autodesk and projection display specifications.

Chapter 4: Evaluation of visitor experiences at St Augustine's Abbey

4.1 Introduction

This Chapter evaluates heritage experiences at St Augustine's Abbey as part of the two stages of the study introduced in Chapter 3. The analysis presented in this Chapter is visitor-centric. It intends to identify the characteristics and traits of heritage visitors who attended Stage 1 (S1) and Stage 2 (S2) of the research study. Section 4.2 introduces the demographic information of the study population at Stages 1 and 2. The demographic information presents characteristics of different visitor groups at Stages 1 and 2 from the perspectives of gender, age, place of residence, English Heritage membership and number of visits to heritage sites per year. It also observes the distribution of demographic characteristics among the self-guided and guided-tour, first-time and returning visitors.

Section 4.3 examines visitors' expectations and intentions to visit the Abbey at Stages 1 and 2. It begins with categorising visitor groups based on their expectations of Stage 1 experiences and identifies different visitor groups according to the Dierking and Falk's (1992) Interactive Experience Model. It employs the personal and physical contexts of the Dierking and Falk's model to explore what visitors anticipate gaining from their visit to St Augustine's Abbey in different experience modalities. The personal context is employed to explain the aims and inspiration of different visitor groups with different characteristic traits at Stage 1. Respectively, the physical context is employed to

evaluate visitor expectations at Stage 2, where projection installations are integrated within the physical precincts of the Abbey. In line with examining visitor expectations, this section also evaluates visitors' intention for revisiting the site where relevant as inquired in Stage 1.

Section 4.4 evaluates experiences at Stages 1 and 2. It presents an ASEB grid analysis of heritage experiences on site for both stages. Initially, it contextualises how the grid was adopted to evaluate Stage 1 or 2 experiences. Later, it presents discussions on themes that emerged from the ASEB grid analysis. In the case of Stage 1 experiences, the discussion concentrates on heritage interpretation provided on the guided tour of the Abbey and through displays at the visitor centre and on the Abbey grounds. In the case of Stage 2 experiences, discussions focus on heritage experiences embodied in the Abbey environment and the impact of Spatial Augmented Reality projections installed within the Abbey ruins on visitors' perception of the experience settings.

4.2 Demographic information

The evaluation of heritage experiences at St Augustine's Abbey was conducted in two stages. In total, it received 94 responses. At both stages, visitors to the Abbey held an extensive range of personal attributes. This section presents the demographic attributes of the visitors based on the experience (Stage 1 and/or Stage 2) they attended. The demographic attributes feature gender, age, frequency of heritage visits, place of residence and English Heritage membership. At Stage 1, visitors were also grouped based on their experience modality, namely self-guided, guided-tour, first-time and returning visitors. Visitors were classified according to the aforementioned demographic groups in order to evaluate the heritage experiences of a group with at least one common attribute. Visitor characteristics presented in this section are later employed to differentiate expectations and experiences of a variety of visitor groups with at least one common attribute.

4.2.1 Stage 1

During Stage 1, 65 visitors to the Abbey participated in the research study. Stage 1 included self-guided and guided tour visitations. In the self-guided modality, the visitors observed the site on their own. The self-guided group included 31 participants. In the guided-tour modality, the site manager offered a guided tour, which was explicitly on the subject of 'The Decline and Fall of St Augustine's Abbey'. In total, 34 participants were present at the guided-tour experiences. The guided tours were organised on two occasions: one as part of an English Heritage members' exclusive event and the other as a group booking for participants of this study.

The demographic population of Stage 1 (Table 4.1) consisted of 58.46% (n=38) female and 41.54% (n=27) male visitors. The visitors' age varied extensively: 26.15% (n=17) of the participants were between 18 to 24 years old; 18.64% (n=12) were aged between 25 and 44 years old;18.64% (n=12) of visitors were 45-65 years old, and 36.92% (n=24) were seniors, 65+. The age factor is predominantly employed in Chapter 5 to examine how heritage experiences may differ depending on age groups. Comparison between age visitor classifications, particularly non-senior and senior participants, investigates how these visitors perceive conventional and enhanced heritage experiences.

Table 4.1: Demographics information of participants at Stage 1

Demographics	**Female**	**Male**	**English Heritage member**
18-24 years old	26.32%	25.93%	11.76%
25-44 years old	13.16%	25.93%	0.00%
45-65 years old	23.68%	11.11%	17.65%
65+ years old	36.84%	37.04%	70.59%
S1 population	58.46%	41.54%	26.15%

In terms of place of residence, 87.69% (n=57) of visitors claimed to be living in County of Kent. Another 6.15% (n=4) of visitors lived in other parts of the UK, including Greater London. It is to note that 6.15% (n=4) of participants did not provide an answer to this question. More specifically, 42 visitors were based locally to St Augustine's Abbey in Canterbury. However, only 15 participants from Canterbury had previously visited the Abbey before the study. Membership of English Heritage is another attribute that was surveyed. The membership allows visitors to visit any sites managed

by English Heritage as many times as they wish without paying admission fees during the membership period. Membership of English Heritage is surveyed to investigate the interest of different visitor clusters in visiting heritage sites on a regular basis. This question intended to understand the likelihood of English Heritage members visiting the Abbey, considering that they lived local to the site in Kent County. The survey results demonstrated that 17 out of 65 visitors at Stage 1 were English Heritage members, of which 12 participants were in the senior age group and 5 in the non-senior age group.

On a different note, 55.38% (n=36) of the Study 1 population were visiting the Abbey for the first time. Another 43.08% (n=28) had already visited the Abbey. Also, 1.54% (n=1) of the Study 1 population did not respond to this query. Later in this Chapter, Section 4.2.2 discusses returning visitors' intentions to revisit. Revisit intentions are examined to identify aspects in heritage experiences at the Abbey that encourage visitors to return to the site. Statistics from Statista regarding Southeast England payable attraction sites in 2019[1] demonstrate that Canterbury Cathedral received the greatest number of visitors. St Augustine Abbey, despite being part of the same World Heritage Site as Canterbury Cathedral, is not listed in the ten most visited sites. Further on, Section 4.4 employs first-time and returning visitor groups data to comprehend potential differences in their expectations and experiences.

Table 4.2: Number of visits to St Augustine's Abbey including Stage 1 experience visits

Demographics	**1st-time visitor**	**Returning visitor**	**No data**
18-24 years old	44.44%	3.57%	0.00%
25-44 years old	5.56%	7.14%	0.00%
45-65 years old	8.33%	28.57%	8.33%
65+ years old	19.44%	60.71%	0.00%
S1 population	55.38%	43.08%	1.54%

4.2.2 Revisit intentions

As previously mentioned, returning visitors represent 43.08% (n=28) of the study population. One of the criteria asked of participants at Stage 1 was to identify the reasons

[1]Visit England. (October 20, 2020). Most visited paid attractions in South East England in 2019 (in 1,000s) [Graph]. In Statista. Retrieved August 02, 2021, from https://www.statista.com/statistics/425268/leading-paid-attractions-in-south-east-england/

as to why they were visiting St Augustine's Abbey. Participants of this study expressed four reasons as to why they were revisiting the site. Visitors' interest in taking part in this research study and being involved in the evaluation of visitors' experiences before and after projection displays onsite was listed as the key reasons revisiting, with 12 out of 28 mentions.

The second most referenced reason, with 6 out of 28 responses, was the opportunity of being offered a guided tour of St Augustine's Abbey either as part of English Heritage member events or a group booking. The following statement, mentioned in five cases, was that the visit would be a chance to learn about this historic site and explore it, including observing any changes it may have undergone over time and since their previous visit. Lastly, three cases mentioned that the visit provided them with the opportunity to bring or accompany other visitors to the site.

The survey at Stage 1 also looked into whether participating visitors had previous knowledge of the site. Participants were asked if they had looked up St Augustine's Abbey before their visit and what reasons compelled them to do so. Participants listed two main research methods: 1) English Heritage guidebooks of St Augustine's Abbey; and 2) online search engines and websites, including the English Heritage web page. The reasons for looking up the site before their visits fall into two categories. Firstly, to get an insight into the site, and its historical significance as part of Canterbury. Secondly, to find answers about the site as a place to visit (e.g., opening hours, admission costs, parking etc.). In the case of heritage online presence, statistics on a national scale in England between April 2017 and March 2018[2] show that people who visited heritage websites during that period primarily looked for information such and opening hours and directions. Learning about historic qualities of the site falls in the third place and taking a virtual tour of the heritage in the fifth place with only 10.3% references.

[2]Department for Digital, Culture, Media and Sport (UK). (August 30, 2018). Reasons for visiting cultural heritage websites in England in 2017/18 [Graph]. In Statista. Retrieved August 02, 2021, from https://www.statista.com/statistics/418460/heritage-website-visits-reasons-uk-england/

4.2.3 Stage 2

The population in Stage 2 consisted of 31 participants who also engaged at Stage 1; an additional group of 29 visitors were recruited who only engaged with this research at Stage 2. Similar to Stage 1, Stage 2 is also characterised by a wide demographic (Table 4.3), with 51.67% (n=31) females and 48.33% (n=29) males. In terms of distribution of the age groups, 31.67% (n=19) of the participants were between 18-24 years old, 28.33% (n=17) were between 25-44, 16.67% (n=10) were 45-65, and 23.33% (n=14) were seniors aged 65+. In addition, 25% (n=15) of the study population claimed to be English Heritage members. The results indicate that age factor and English Heritage membership have a direct relationship. The percentage of participants who were English Heritage groups generally increases among age groups with the exception of 25-44 years old. For example, 13.33% (n=2) of the 18-24 years old claimed to be English Heritage members, whereas, among the 65+ age group, this figure increases to 46.67% (n=7).

Table 4.3: Demographics information of participants at Stage 2

Demographics	**Female**	**Male**	**English Heritage member**	**Total**
18-24 years old	32.26%	31.03%	13.33%	31.67%
25-44 years old	22.58%	34.48%	6.67%	28.33%
45-65 years old	19.35%	13.79%	33.33%	16.67%
65+ years old	25.81%	20.69%	46.67%	23.33%
S2 population	51.67%	48.33%	25.00%	100.00%

The data on the frequency of heritage visits of all participants between different age groups does not demonstrate a particular pattern except for 18-24 years old. This age group is least likely to visit a heritage site once every three months and most likely to do so every six to twelfth months.

4.3 Visit expectations and intentions

4.3.1 Identity-related expectations at Stage 1

Chapter 2 drew on the significance of enquiring about visitors' expectations in understanding experiences. In particular, it reflected on the literature that categorises visitors depending on their expectation and motivation of visit within the four realms of experience defined by Pine and Gilmore (1998). It also discussed Dierking and Falk's (1992) 'Interactive Experience Model' that facilitates understanding visitor experiences pre-, during, and after experiences.

One of the objectives of this research was to identify participants' expectations of the visit and evaluate visitor satisfaction of experiences. This is done by comparing initial expectations and experiences at St Augustine's Abbey according to different experience modalities. For Stage 1, the visitors' expectations are observed based on the visitation mode being either self-guided or a guided tour and being a first time or returning visitor. Participants were classified into these groups in order to interpret how different expectations relate to the experience modality and number of visits to the site. The personal context of Dierking and Falk's model (1992) reflects on the interests and intentions of persons for visitations. It embodies the differences in individuals' interests and inspirations for visiting, which impacts the visitors' expectations of the experience and the experience itself. Based on the personal context, Falk (2006) introduced an identity-related related typology that comprises of five categories: 'Explorers', 'Facilitators', Professional/Hobbyists', and 'Spiritual Pilgrims'. In later texts such as Falk and Storksdieck (2010) and Hughes, Bond, and Ballantyne (2013), 'Rechargers' is used instead of 'Spiritual Pilgrims'.

Hughes, Bond, and Ballantyne (2013) interpret Falk (2006) identity-related categories based on a study on visits to UK cathedrals and religious sites as:
"1. Explorers who are driven by curiosity and have interest in the site they are visiting. They also expect to learn from their visit.
2. Facilitators who are socially motivated and focus on facilitating the experience and learning from others included in their accompanied social group.

3. Professional or hobbyists who have close ties with the site due to their profession or hobbies.

4. Experience Seekers who find the site as an important destination as would be satisfied when they have been there and done that.

5. Rechargers who seek contemplative, spiritual or restorative experiences." (Hughes, Bond, and Ballantyne, 2013, p 212)

Visitor expectations in Stage 1 can be summarised in eight statements as presented in Table 4.4. The statements reflect different identity typologies from 'Explorers' to 'Rechargers'. Accordingly, participants in different visitation modalities showed different expectations in response to the typology. It is evident that in this study, self-guided visitors (24 cases) are mostly 'Experience Seekers'. This group of visitors expressed their interest in seeing the site and observing its relics, from fragmentary ruins to more structural elements still standing to this date. This expectation implies that participants were, to some extent, aware that the artefacts on display at the visitor centre and the grounds of the Abbey were fragmentary. Despite the fragmentary remains, the collection of artefacts and the remains were considered to be helpful in imagining what existed before. Additionally, other self-guided visitors anticipated seeing a display of preserved artefacts of St Augustine's Abbey along with interpretation boards and audio-visual displays providing information about the site's offerings. Displays narrating the history of the Abbey were at the core of their expectations.

Table 4.4: Visitors' expectations of the experience at Stage 1

Expectations	Mentions	Guided-tour visitors	Self-guided visitors	1st-time visitors	Returning visitors
1. See the remains of St Augustine's Abbey,including its ruins, structures and outlining architecture.	23	10	13	17	5
2. Learn about the site's history, from the monastic life and its people to Abbey's archaeology and developments over time.	17	13	4	9	8
3. See a display of St Augustine's Abbey's preserved artefacts and interpretation boards and audio-visual displays providing information about the site's offerings.	15	4	11	8	6
4. Have an informative, and in case of returning visitors, an enhanced visitation experience.	7	3	4	2	5
5. Very little to no expectations.	6	2	4	3	3
6. Receive a tour of St Augustine's Abbey.	5	5	0	2	3
7. Observe other precincts previously part of the Abbey, for example, The King's School.	1	0	1	1	0
8. Refresh memory of the past.	1	0	1	0	1

Case studies exploring identity-related motivations of visitors reflect that different visitor groups at particular sites express diverse motivations. As an example, a study by Hughes, Bond, and Ballantyne (2013) on Canterbury Cathedral reports that the majority of visitors were either 'Hobbyists' or 'Experience Seekers' as they claimed to be visiting the cathedral because it is associated with an important era of English cultural heritage and is an important tourist destination. Compared to other visitors, 'Facilitators' found interpretive topics at the Canterbury Cathedral of higher importance. The interpretive topics included the history and significance of the site, life and religious practices, information about relics and artworks on site, and the conservation strategy and processes.

Guided visitors attending a tour on "The Decline and Fall of St Augustine's Abbey," on the contrary, specifically expressed expectations that associated them with being 'Explorers'. A significant number of cases from the guided tour visitors directly mentioned that they anticipated to have an informative visit and particularly learn about St Augustine's Abbey's history from the monastic life and its people to the Abbey's archaeology and developments over time. 'Explorers' also stated they anticipated that their visit to the Abbey would be an opportunity to learn more from their guided tour compared to other available resources with similar information, such as the guidebooks

on the Abbey.

Hristov, Naumov, and Petrova (2018) reflect on similar visitor motivations at Wrest Park, an English Heritage property that stretches over 90 acres of gardens and amalgamates three centuries of English garden design. The site includes a 19th-century English architecture style inspired by the 18th-century French chateau style, an Archer pavilion. Historic gardens are often seen as leisure places. Wrest Park historic gardens and leisure facilities are noted as pull factors for this heritage site. However, Hristov, Naumov, and Petrova (2018) report that 40% of visitors were interested in both leisure activities and the history and significance of the heritage site. It is notable that the sample surveyed at Wrest Park were either members of English Heritage or the National Trust. This study has also shown that 'Explorers' in historic gardens seek opportunities that provide a story about the place.

The initial hypothesis was that English Heritage members would show identity-related characteristics as 'Professionals' or 'Hobbyists' as their membership may result from affiliation with the English Heritage organisation or their particular interest in visiting English Heritage sites. Despite the assumption, English Heritage members' expectations of the visit referred to a particular interest in learning about St Augustine's Abbey and were not predominantly concerned with visiting another heritage site. Expectation statements coming from first-time and returning visitors also presented that the two groups had different intentions when visiting the site. First-time visitors to the Abbey specifically mentioned that they expected to learn about the site and its remains first and foremost. On the contrary, returning visitors who already had prior knowledge about the site from previous visit(s) showed interest in having a more informative visit about some aspects of the monastic life at the Abbey in the past.

This section concludes that heritage and cultural institutions receive visitors with a variety of motivations and expectations. Hence, to satisfy wider groups of visitors, these institutions require considering variations of experiences that appeal to different types of visitors with diverse interests and backgrounds.

4.3.2 Settings-related expectations at Stage 2

Visitor expectations at Stage 2 (Table 4.5) were evaluated differently from Stage 1. This is due to the fact that Stage 2 took place in an altered physical context where projections were installed among the Abbey ruins. The visitors were explicitly invited to Stage 2 to see digital reconstructions of Abbey artefacts in projection forms that the researcher of this PhD had created. The visitors who attended Stage 2 were primarily. The visitors who attended Stage 2 were primarily given general information about the context of their visit in the invitation, which informed them about projections of reconstructed imageries of non-existent artefacts of the Abbey on site. The physical settings of the heritage site, particularly the visibility of ruins remaining relics onsite in the dark, and artificial lighting in the dark radically differ from Stage 1 experiences. Therefore, under such circumstances, the evaluation of visitors' expectations and experiences was piloted around the physical context of their visit instead of the personal context, which was examined during Stage 1.

Table 4.5: Visitors' expectations of the experience at Stage 2

Expectations	**Mentions**	**Stage 1 & 2 visitors**	**Stage 2 only visitors**	**Non-senior visitors**	**Senior Visitors**
1. Displays of image projections of non-existent Abbey artefacts presented in realistic and or artistic methods.	30	15	15	26	4
2. Incorporation of technical and dynamic additions or alternations to the site. An extension to the displays presented in Stage 1. With a particular interest in seeing the influence of projections at St Augustine's Abbey.	13	8	5	8	5
3. Limited to no expectations or unsure what to expect.	9	3	6	8	1
4. An enhanced visitor experience and opportunity to gain a better understanding and interpretation of the site.	6	3	3	3	3
5. A different visitation experience due to the events taking place in dark hours after the usual opening times.	2	1	1	1	1

Night-time events, in particular those with light projections, impact the exhibits primarily by the transformations they bring to the environment and influencing visitors' perception of the exhibits and, therefore, influence visitors' interpretation of the exhibit (Germain, 2016). Germain (2016) observes the influence of artificial lighting in indoor settings based on night-time events at the Louvre Museum, Paris. On the contrary, Lovell and Griffin (2019) explore the ways in which light installations and architectural elements interact in outdoor environments. They suggest that architectural elements could be physically or metaphysically active or passive in the projection mappings results in various types of illuminations. In passive mode, architectural buildings and facades replace screens for light projections with no reference to the building itself. Torre (2015) states that the overlay of imageries on buildings often create a dialectic that points or counterpoints between the building and the overlay imagery. Lovell and Griffin (2019) describe the projected media for architecturally physically active as "luminous cloaking of the building, which neither seeks to deceive nor conjure illusion, but merely aims to clothe the built form in a new skin" (Lovell and Griffin, 2019, p 475).

Visitors' expectations of Stage 2 at St Augustine's Abbey indicates that the majority of the visitors, 30 cases, had a realistic understanding of the fundamental notions of the events, including visual projections of Abbey artefacts and reconstruction. The figures in this study show that just under almost a quarter of the respondents anticipated the events to be extraordinary to the usual settings and perhaps dynamic enough to engage under different visitation circumstances. In addition, participants expressed their anticipation of encountering technical or dynamic alterations to the site beyond the usual display arrangements that visitors had encountered during Stage 1. From a demographic's perspective, the initial hypothesis was that the younger generation was more familiar with terminologies including 'projection' and 'digital' used in advertising this study. Furthermore, younger participants arguably would more easily agree to the blending of modern technologies with a historical heritage site.

Accordingly, statements of expectations from non-senior participants reference 'digital display' six times more than senior participants. However, the data reveals that the number of visits does not influence visitor expectations at Stage 2.

4.4 ASEB grid analysis of experiences

4.4.1 Context

Heritage experiences at Stages 1 and 2 were analysed using the ASEB (Activities, Settings, Experiences, Benefits) and SWOT (Strengths, Weaknesses, Opportunities, Threats) grid analysis. Using the grid analysis, the following section evaluates different aspects of heritage experiences at Stages 1 and 2, including the different experience modalities, settings where experiences occur, perceived value of experiences and the benefits of these experiences as reported by the participants of the study themselves. The grid analysis helps to understand the strength and weaknesses of the experiences and identify where opportunities exist to enhance heritage experiences at St Augustine's Abbey. The elements of ASEB grid analysis for Stage 1 experiences were employed as below:

Activities: experience modalities offered at Stage 1, namely self-guided and guided-tour visits. Audio-guide assisted experiences are evaluated separately and accordingly presented in Chapter 5, Section 5.2.
Settings: the environment at St Augustine's Abbey in which heritage experiences were examined and evaluated, including the visitor centre and the Abbey grounds.
Experiences: heritage experiences at St Augustine's Abbey.
Benefits: prominent benefits identified by Stage 1 participants.

In the case of Stage 2 experiences, the grid aspects reflect:
Activities: experience of encountering digital reconstruction of the Abbey's non-existent artefacts among the ruins in the form of Spatial Augmented Reality projections.
Settings: Abbey grounds where the Spatial Augmented Reality projections were installed.
Experiences: experience of St Augustine's Abbey considering projection interventions onsite.
Benefits: prominent benefits identified by Stage 2 participants.

The ASEB grid analysis of Stage 1 and 2 experiences (Tables 4.6 and 4.7 respectively)

identified a number of themes that visitors reported in relation to their heritage experiences at St Augustine's. At Stage 1 experiences, the themes included heritage interpretation at the visitor centre and on the Abbey grounds, and where relevant, during the guided tour of the Abbey. The survey questions about heritage interpretations on site at Stage 1 experiences (as formerly presented in Chapter 3, Section 3.5.3.3) intended to realise to what degree visitors find the current displays and interpretation methods sufficient and accurate about the historic Abbey. The Stage 1 ASEB analysis presented in Sections 4.4.2 and 4.4.3 discusses interpretation methods at St Augustine's Abbey and perceived satisfaction of the experiences. At Stage 2 experiences, themes identified through ASEB grid analysis reflect on heritage experiences related to digital heritage interpretation, digital intervention in heritage settings, and its consequences on the experiences. Section 4.4.4 accordingly discusses heritage experiences at Stage 2 regarding 'phygital', a term that references the integration of physical and digital approaches to heritage and embodiment in heritage settings under the effect of digital technologies.

Table 4.6: Stage 1 ASEB grid analysis

	Activities	**Settings**	**Experiences**	**Benefits**
Strengths	- English Heritage offers a variety of experiences modalities e,g. guided-tours, self-guided, audio-guided and VR. The guided tour provides extensive information of the the fall and dissolution of the Abbey.	- Outdoor settings allows walk-around the ruins.	- The display at the visitor centre and on the grounds interprets history, historical eras and development of the site.	- The site is more extensive than some visitors expected and offers a great deal. The artefacts on display are well preserved.
Weaknesses	- The guide tour may not be as informative for visitors with little historical knowledge.	- There is no particular way finding path to see the displays in the visitor centre. It would be helpful for visitors to see footage on the developments of the Abbey first and then explore the interpretations made on the historical eras.	- It is quite difficult to imagine how the Abbey looked like before dissolution. The footage provides some insights but one cannot mentally map such information onto the ruins. The displays are modern and lack historical touch.	- Less structures remains in-situ.
Opportunities	- The guided-tour can improve in terms of narration and storytelling.	- Incorporating more historical elements can result in higher sense of place and immersion within the site.	- The display can be more engaging and allow interaction with some artefacts. Re-enactment or guides dressed could add value to the experience. Foreign language visitors can benefit from translations of interpretation boards and displays.	- Multiple visits can enrich visitors learning and understanding of the historical monastic.
Threats	- The timing of tour meant that some visitors did not spend as much time as wanted exploring one area of the Abbey.	- Weather conditions impact the experience as the grounds are outdoors and not roofed.	- The experience of the Abbey is limited to the precincts managed by English Heritage.	- Visitors historical knowledge about the site could influence their understanding of the interpretations provided.

Table 4.7: Stage 2 ASEB grid analysis

	Activities	**Settings**	**Experiences**	**Benefits**
Strengths	- Exploring the site with projections installed on the grounds.	- Displays of SAR allow walk around the site. Projection displays do not obstruct the view of the Abbey.They add details to the settings of the Abbey and are aesthetic and practical method to showcase artefacts. Projections create immersive environment within the Abbey ruins.	- Projections trigger visitor imaginations and are exciting to look at, particularly when they change or contain different information from different viewing angles. Projections compared to VR fit a more group-focused experience.	- Projections bring some life to otherwise solid stones and allow envisioning the Abbey before dissolution including the height of structures of the site and the authentic artefacts.
Weaknesses	- Further information about content of the projections could help better understanding of them.	- The ruins were not clearly visible in the dark.	- The experience was only focused on the projections. Visitors could not observe the ruins outside the projection areas.	- Quality of images and installation pieces can be improved. Projections were quite static.
Opportunities	- A combination of guided-tour or audio narration and projection displays can enhance understanding of the site.	- Projection displays in the ruins can be larger and present more artefacts.	- Projections could supplement other interpretation methods to provide further information during the visit.	- Projections could be animated.
Threats	- Projections best perform at night.	- Weather conditions impact the experience as the grounds are outdoors and not roofed.	- Exploring the Abbey was limited to the projection displays and the nearby illuminated areas.	- Benefits of the projections could be overshadowed by visitors' ability to imagine the bigger picture.

Further to the discussion on themes identified in the ASEB grid analysis, Sections 4.3.1 to 4.3.4 reflect on the perceived rate of experience satisfaction. Theoretically, satisfaction has been explored as a cognitive state that could be influenced by previous cognition and could result from subjective experiences and previous references. The model of expectation (Oliver, 1977) is one of the most common models used for measuring satisfaction. It is based on the fact that expectations and fulfilment of which result in (dis)confirmation, and (dis)confirmation results in (dis)satisfaction. In this model, satisfaction and dissatisfaction result from meeting or contradicting expectations. This model has been explored in different experience contexts, including consumer experiences (Bearden and Teel, 1983), disconfirmation and perceived performance (Churchill and Surprenant, 1982) and the relationship between expectations, satisfaction and intention to repeat consumption (Prakash and Loundsbury, 1984). Oliver (1977) argues that interpretations that consumers make are related to their expectations. Accordingly, as Woodruff, Cadotte, and Jenkins (1983), Higgs, Polonsky, and Hollick (2005) and De Rojas and Camarero (2008) suggest, expectations could be considered as predictions or beliefs made by consumers about performance and perceived quality of the experience they are about to receive in the future.

In addition, Spreng and Page (2001) state that levels of expectations influence how much expectations affect post-experience evaluations and satisfaction. For example, if little expectations are held, the consumer is not dissatisfied if their expectations are met. In other words, disconfirmation could not have a strong impact on satisfaction.

An alternative approach for measuring satisfaction is using the affective model, which is based on emotions. De Rojas and Camarero (2008) interpret the model of expectations for satisfaction in the heritage context. They argue that both perceived quality and emotions are direct determinants of satisfaction.

In order to understand the extent to which heritage experiences at St Augustine's Abbey are satisfactory for different visitor groups, experiences are compared to expectations. Hence, satisfaction is acknowledged as where the visitor experience is delivered to fulfil visitor expectations. Dissatisfaction, on the contrary, is regarded as when visitors could not find what they expected from the visit. Qualitative survey results on experiences

at Stages 1 and 2 were categorised into a spectrum with three stops. On one end of the spectrum, sit responses from visitors who found heritage experiences better than what they expected. This group are satisfied visitors. On the other end of the spectrum, sit responses from visitors who found the experiences worse than expected. This group are dissatisfied visitors. Halfway through satisfaction and dissatisfaction stood the third group of visitors who were relatively satisfied with their visitation experience.

4.4.2 Guided-tour interpretations

The first theme identified as a result of the ASEB analysis of Stage 1 experience was the guided tours. At St Augustine's Abbey, the site manager offered the guided tour on the subject of 'The Decline and Fall of St Augustine's Abbey'. The survey results of guided-tour visitors indicate that they considered the tour guide the main contributor to the experience. Visitors reflected that during the experience, the tour guide was the sole narrator, and visitors were sole listeners. For the most duration of the tour, the tour guide interpreted historical events that led to the fall of the Abbey and how consequently the buildings evolved and/or were dissolved.

According to Galí and Aulet (2019), Guided tour discussions focus on three aspects: 1) the performance of the tour guide, 2) the guided tour, and 3) the relationship between delivering a guided tour and satisfaction of the service provided (Chan, Hsu, and Baum, 2015). Ababneh (2018) argues that interpretation in guided heritage tours needs to be adjusted according to the site. The tour cannot be tailored to please different expectations and interests because people perceive places differently. Larsen and Meged (2013) explain this phenomenon by referring to Goffman (1959) on face-to-face interactions, which embody articulation and conversing. According to Weiler and Ham (2001), face-to-face interpretation contributes to storytelling as it enhances visitors' understanding of heritage resources.

Cohen (1985) argues that the role of the tour guide emerges from being a pathfinder and mentor. The pathfinder role guides the visitor through the place they wish to discover, whilst the mentor role refers to interpreting and communicating information; this derives from the definition of mentor as someone who provides intellectual guid-

ance. According to Cohen (1985), tour guiding consists of selection of itinerary of the tour, dissemination of information, interpretation as a communicating function, and fabrication.

Weiler and Walker (2014) discuss the communicative role of the tour guide in delivering experiences as well as visitors' expectation of the tour guide and tour guide's efficiency in communicating information. Wong (2013), for example, evaluate historic interpretation at Macau's historical centre which was inscribed on the World Heritage List based on well-preserved colonial heritage. Lugosi and Bray (2008) elaborate on guided tour narratives and explain how different storytelling methods could result in including and excluding information, change emphases and result in different endings and impacts.

Reisinger and Steiner (2006) suggest that the role of tour guides should be examined with respect to what they do and how their roles as interpreters correlates with making meaning and interpretation. Reflections on the delivery of the guided tour at St Augustine's Abbey indicate that experience was mainly one-way and lacked visitor engagement and discussions. Additionally, the guided tour included very specific historical information and may not have been particularly informative for visitors with little historical knowledge. This became evident when during the guided tour, the guide asked the audience a few questions. However, as the questions and topic were very specific, only visitors with special historical knowledge could participate in the conversation. Weiler and Ham (2001) state that in guided interpretation, the guide needs to make what is interpreted understandable as visitors pay attention to what is meaningful to them. Participants of the study also mentioned that it would also be beneficial to allow visitors to spend more time personally exploring the locations included in the guided tour. Hence, as visitors report, a more engaging model for delivering the guided tour at the Abbey can enhance the experiences.

A case study on the guided tour of Barcelona City Hall (Crespi-Vallbona, 2021), which offers Barcelonan and Catalan unique culture and identity, concludes that the design of the guided tours should be dynamic, trigger emotions and mindfulness, and involve visitor engagement and personal meaning-making. Similarly, Barbara (2020) evaluated the mediating role of tour guides in the heritage interpretation of Malta. Barbara

(2020) emphasises multi-vocality of presentation, meaning heritage interpretation of tour guides should be based on multi-levels and not solely inferred from documents and the remains. Furthermore, guided tour experiences should encompass social bonding. The tour guide needs to act as 'the missing link' by forming alliances and approaching the audiences, intensifying the sharing of experiences. Therefore, at St Augustine's Abbey, opportunities exist to elaborate on the mediating role of the tour guide and offer more engaging experiences by creating dialogues with the audience.

Moreover, a visitor at Stage 1 reported that the guided tour mainly focused on the buildings and lacked information about the life and people of Abbey. In addition to interpreting the monastic complex and the structures as the Abbey dissolved, further information about the materials used in the Abbey and their destiny after the dissolution could have provide links between the historical events and the present-day context of historical artefacts excavation and conservation of the artefacts. Case studies on the role and interpretive narration of tour guides in heritage also demonstrate that some aspects of the heritage are more elaborately presented compared to others. Observation at Jerash Archaeological City Ababneh (2018), a World Heritage site on the Tentative List of Jordan, indicates that guided tour interpretations focus on the historical chronology, site layout, and economic and religious heritage. Such interpretations are key to introducing visitors to the site monuments and objects, although visitors recognise a gap in tour guides explaining the site's heritage in greater depth. Ababneh (2018) emphasise that in many cases, tour guides fail to assert a sense of place or provide links between historical narratives and the present time.

The comparison between expectations and experiences from the guided-tour visitors indicated that 11.76 (n=4) were dissatisfied with their experiences, 47.06% (n=16) were moderately satisfied, and 41.18% (n=14) were satisfied with the guided-tour experience.

4.4.3 Heritage interpretation through displays

In Chapter 3, Section 3.2.3 introduced the visitor centre at St Augustine's Abbey and the displays. The survey results demonstrate that a significant majority of Stage 1 visitors believe that the interpretation methods in place at the visitor centre and on

the Abbey grounds provide sufficient information and contextualise the history and developments of the monastic complex before its dissolution. Survey results indicate that, in general, visitors found the displays in the visitor centre very informative. In particular, participants mentioned the exhibit arrangements in place and interpretation of the artefacts based on mutual themes such as historical era, make and use. The display in the visitor centre reflects on the developments of the site, architecture, design and appliance from the early times of the Abbey until its dissolution.

In addition, the use of audio-visual content, the remake of historical clothing, the VR and interpretation boards on the Abbey grounds collectively provide clear and comprehensive information on the historic Abbey. The artefacts on display at the visitor centre are well-preserved. Whilst many commented on the advantages of the display arrangement in the visitor centre, some visitors reported that it lacks a historical touch and is very modern. Therefore, inside the visitor centre, one is in a very modern setting, yet when outside on the Abbey grounds, one finds oneself in an archaeological ruin. The presentation style of the site in the visitor centre and on the Abbey grounds contradict themselves.

Uzzell (1996) explains that the aim of heritage interpretation is to contribute to visitors' making sense of place and the identity of the place and so it should be planned in a way to achieve such outcomes. At the same time, Uzzell (1996) argues that there is little doubt about how heritage interpretation could be a key player in enhancing awareness, understanding and appreciation of a place. Additionally, Staiff (2014) states that heritage interpretation has shifted from being ethnographical, historical, ecological, and archaeologically centric to critically questioning visitors' learning and effective communication.

The chronology of drafts and revisions for the ICOMOS Charter for the interpretation of cultural heritage[3] demonstrates that defining and differentiating interpretation and presentation have been core to the idea since its origin in 2002 until it was submitted in 2007 and adapted in 2008. Silberman (2006) reviews the ICOMOS Charter to date

[3]ICOMOS, Chronology of the drafting, review, and revision of the proposed ICOMOS Charter for the Interpretation and Presentation of Cultural Heritage. Available at https://www.icomos.org/quebec2008/charters/interpretation/EN_Chronology_Interpretation_Charter.pdf. Last Accessed 08 May 2022.

with particular attention to what interpretation means in the contemporary context, arguing that interpretation refers to totality of activities and creativity in simulating heritage whereas presentation denotes arranging information in a planned manner and allowing physical access to the site. As such, interpretation gives life to collections and archives that define the relationship between people and the material that remain in their surroundings.

The ICOMOS (2008) states that the expansion of interpretive activities and interpretation of cultural heritage has expanded, arousing questions central to conservation and public appreciation of cultural heritage sites, such as:
"- What are the accepted and acceptable goals for the Interpretation and Presentation of cultural heritage sites?
- What principles should help determine which technical means and methods are appropriate in particular cultural and heritage contexts?
- What general ethical and professional considerations should help shape Interpretation and Presentation in light of its wide variety of specific forms and techniques?" (ICOMOS, 2008, p 2).

The Ename Charter accordingly defines interpretation, presentation, interpretive infrastructure, site interpreters and cultural heritage sites. It also denotes the objectives and principles for interpretation and presentation including context and setting and authenticity which are further discussed below with reference to the analysis at St Augustine's Abbey. According to the Charter, interpretation "refers to the full range of potential activities intended to heighten public awareness and enhance understanding of cultural heritage site" and presentation "denotes the carefully planned communication of interpretive content through the arrangement of interpretive information, physical access, and interpretive infrastructure at a cultural heritage site" (ICOMOS, 2008, p 4).

The analysis in this section examines how interpretation an presentation of interpretive content contributes to visitors' experiences and the process of making sense of place. Visitors to St Augustine's Abbey expressed that a more interactive experience and perhaps some closer interaction with the historical artefacts could enhance experi-

ences. Similarly, at Hadrian's Wall, part of a World Heritage Site in northern England (Willis, 2009), visitors expressed they benefited from close observation of archaeological artefacts. Vindolanda is one of the forts of the Hadrian's Roman Wall. Alike St Augustine's Abbey, it is largely an open-air site, with excavated finds and a display of replicated Roman structures to demonstrate elements of life dating back to Roman times. Vindolanda undertakes annual excavations that are open to the public; thus, visitors have the opportunity to see archaeological objects discovered. Willis' (2009) study on site has proved that visitors benefit a great deal from the excavation program at Vindolanda and show engagement in discussions about conservation and preservation of artefacts as part of the excavation programmes. Therefore, engaging visitors with artefacts and archaeological objects through activities on site can further interest visitors in the displays.

As Moreno-Melgarejo et al. (2019) state, interpretation methods should encourage experiential aspects of heritage, "turning heritage phenomena into experiences, provoking resonance and participation, and fostering stewardship for all heritage"(Moreno-Melgarejo et al., 2019, p 106). At St Augustine's Abbey, whilst the experience offers information about the historical eras, structures, and architectural artefacts, some visitors reported that it was difficult to envision how the Abbey looked before dissolution. In other words, although interpretation methods reference the architecture of the site and the whereabouts of the structures, it was difficult for some visitors to map such information on the ruins mentally. However, some visitors found the visual interpretations in the visitor centre helpful to identify the remains of the structures as they lie on the Abbey grounds. Looking at the more significant visual information helped visitors negotiate links between the structures, their style, scale and era of development. Moreover, particular visitors elaborated on the fact that they are were visual learners. Hence having access to visual information about the Abbey before its destruction helped them appreciate the site better. As Grima (2017) also states, one of the challenges in presenting archaeological sites to visitors is contextualising the structures' scale and layout. For example, Grima (2017) notes the Segedunum Roman Fort at the eastern end of the Hadrian's Wall, where, due to very limited number of preserved artefacts on the ground, it is challenging to imagine the fort's layout. Later, Chapter

5 discusses how VR influenced constructing a vision of the site as visitors explored the ruins and experienced the 3D recreated Abbey. Stage 2 experiences presented in Section 4.4.3 discusses presence in space and embodiment in further details.

The survey results also report that for 26 cases, being able to walk around the site and navigate the spatial configuration of the archaeological ruins was key, hence closer interaction with the site was the primary way they experienced the site. Another 18 cases reported multisensory engagement, including sight, touch, and feel of the ruins on the Abbey grounds and at the visitor centre. 21 cases referred to listening to audio-guides and guided interpretation as an observation method, denoting the importance of auditory cues and perception in understanding facts about the site.

Despite displays in the visitor centre and interpretation boards on the Abbey grounds, a number of visitors mentioned that further explanation in the visitor centre of what has been discovered on the grounds would help to contextualise the use and place of the artefacts better. Visitors to the Abbey at Stage 1 also mentioned that whilst the display attracts adults and engages them with reading interpretive text made available in the visitor centre, a more dynamic presentation and interpretation of the artefacts, especially activities could engage younger visitors, in particular children. According to Liu and Lin (2021) constructing a systematic interpretation and presentation system that efficiently communicates the value of cultural heritage to visitors can be a challenging task. However, their study on the Old Zuoying City in Taiwan demonstrated an interactive approach where heritage is not only preserved in isolation but facilitates connecting people with the site and encourages participation as an effective approach. Liu and Lin (2021) reflect on the advantage of multiple experiences at the Old Zuoying City; for example, the public participatory archaeological project which led to experiential activities on site for visitors not only provides interpretation but also contributes towards conservation management programmes, archaeological research and developing cultural tourism. At St Augustine's Abbey, expanding interpretation methods to include experiential aspects can enhance experiences. For instance, providing experiential interpretations, that reflect on the life and practices at the historic Abbey, could expand visitors' understanding of notions close to the historical and cultural significance of the site.

The display could also benefit from additional re-enactment on site or guides dressed as monks. It will elevate visitor engagement with people and life at the monastic complex. Currently, a number of Benedictine robes are available at the visitor centre for visitors to wear whilst exploring the site. One participant particularly noted the Yeoman Wardens at the Tower of London, who also guide visitors and provide commentary. Visitor experience could benefit from an additional layer of immersion and connection with people who once lived and worshipped at the Abbey. However, whilst visitors suggested that enactment could enhance their experiences, this notion is criticised from theoretical point of view. Arguments around enactment suggest that it could question authenticity (Urry, 1990) or result in staged authenticity (MacCannell, 1973).

Carnegie and Mccabe (2008) state that our understanding of the past depends on material and evidence of activities that occurred in the past and performed by people of the past. According to Carnegie and Mccabe (2008), often heritage re-enactment does not aim to present historical facts but to showcase signs or the surface-value of what places and cultures of the past. As such, information provided in the interpretation are taken out of context and serve edutainment purposes.

Re-enactment, in this context, could transform sites or landscapes into living places that represent people and objects of the past. Interpretation as such could be delivered through 'living history' (Coles and Armstrong, 2008). However, according to Pearce (1995), the past cannot be truly represented. Re-enactment is also examined in heritage tourism with respect to commodification (Halewood and Hannam, 2001), events and festivals (Cudny, Jolliffe, and Guz, 2021) as well as heritage consumption through re-enactment. Fu et al. (2018) visitors' perceived value of heritage re-enactment, particularly in relation to community-based festivals. They argue where heritage re-enactment is attached to the local identity and the history of the region, notions such as community pride and past lifestyle matter and are highly valued. Therefore, heritage re-enactment as such differs from celebrative events.

English Heritage provides interpretation through enactment specifically to construct the past for visitors. English Heritage considers re-enactment as a way to bring history to life and holds events at nominated sites to presents personas who made history.

Lovell and Hitchmough (2020) discuss how storytelling in re-enactment could affect authenticity and the perceived difference between the original and copy. They based their arguments on how Buffalo Bill's Wild West tours in the UK and the Westworld television series re-enact the stories of American frontiers. Lovell and Hitchmough (2020) argue that, in both cases, authenticity is simulated yet subject to discourses such as originality and historical interpretation. They argue that, for example, in the case Buffalo Bill's Wild where a combination of acts, characters and sceneries are employed, authenticity is negotiated and perceived in relation to accurate depiction of the life of American frontiers. In the case of Westworld, simulated authenticity is evident in landscapes portrayed as the real locations of Westworld.

The comparison between visitors' expectations prior to the visit and collective experiences at Stage 1 demonstrate that 'Experience Seekers' claimed to have had a satisfying experience overall, with 50% (n=12) of them finding the visit better than expected; 23.68% (n=6) found the experience more or less similar to their initial expectation. The survey results suggest that for many 'Experience Seekers', the visit itself and the information provided by the tour guide or the display in the visitor centre offered a considerable amount of information for them to be broadly introduced to the site. However, participants least satisfied with their visitation experience in comparison to their expectations mainly claimed that the site was in a more ruined state than expected or that it did not provide sufficient information about the monastic life which historically happened on site. Moreover, information provided during the visit was more concentrated on St Augustine's Abbey links with other locations rather than the site itself.

4.4.4 Digital installations in heritage settings

As outlined in Section 4.4.1, analysis of Stage 2 experiences concerns heritage experiences on the Abbey grounds where non-existent artefacts were digitally installed among the ruins. Hence, the analysis predominantly concentrates on visitors' experiences in the digitally-altered physical setting. It investigates the impact of 'phygital' (as introduced in Chapter 2) heritage on experiences and visitors' negotiation of the site.

'Phygital', as Turco and Giovannini (2020) state, is a neologism that bridges technology ('digital') with the real world ('physical'). In the context of this research project, 'phygital' is the overlay of digital reconstructions of non-existent Abbey artefacts in the form of projections on the Abbey ruins. The experience evaluation respectively examines the impact of 'phygital' presentation artefacts on visitor experiences, and their understanding of the site which is spatially augmented with light projections. As Ciolfi (2015) mentions, the physical environment in the site is not limited to the display but relates to the overall environment that makes the experience immersive and rich in sensation.

In relation to the settings where experiences occurred, visitors reported that the projections displays did not interfere with the Abbey site as visitors were still able to walk around the site and explore the ruins without any obstacles caused by the projections. Ciolfi (2015) explains embodiment and experiences of open-air heritage places using technology with the aim of immersing visitors into historical atmospheres and helping them to interpret what they encounter in the space. Ciolfi exemplifies Bunratty Folk Park in Ireland which opened in 1960 and displays 32 dwellings that were moved to Bunratty and reconstructed onsite. Bunratty intends to provide insights about rural and traditional lifestyles in Ireland from 1890s to 1950s. Ciolfi (2015) states that augmenting information is helpful in the context of Bunratty. However, visitors need to be allowed to appreciate the objects that exist in physical reality. Ciolfi (2015), based on another case study on Sheffield General Cemetery (Listed on Historic England under the Park and Garden category) also indicates that is it important to make more things visible to visitors wherever structures are no longer present. However, the digital within the physical space should continue support embodied experiences in heritage settings and not stop visitors from fully experiencing the site in physical reality. Accordingly, at St Augustine's Abbey, it is understood that visitors appreciate being able to experience the site as usual and in addition be offered visualisations that could enhance their experience of the site.

Visitors perceived the projection display as additional elements of the site that provide further details about the structures and artefacts, immersing visitors into a space in which visualisations aid better understanding of the Abbey. Therefore, the projections

were not only considered to be aesthetical presentation of lost heritage, but also a practical method to embody lost artefacts within the heritage settings. Brůha et al. (2020) emphasise that placing reconstructed heritage in the correct space is of great importance in terms of context. Based on a study on the lost site of Ostrovský klášter ("Island monastery") and the abandoned medieval town on the Sekanka promontory, Brůha et al. (2020) state that reconstruction of cultural heritage requires considerations on four levels: the artefact level, the architectural level, the urban land and the rural land. This is to contextualise links between the artefacts and the site and the geographical area in wider context. The architectural level engages with the mutual composition of artefacts and larger structures including the positioning, view and surfaces of interiors and exteriors. Thus, presenting reconstructed artefacts requires attention in relation to the broader context where it is being displayed. At St Augustine's Abbey, survey results demonstrated that projection display helped visitors gain a better understanding of the scale and decorative qualities of the ruins.

Stage 2 results indicate that the projection displays not only help visitors to envision non-existent artefacts but also supports them to develop a more comprehensive image of the Abbey with the artefacts digitally present. Chapter 5, Section 5.4.2 discusses the influence of individual projection displays in relation to the site.

At Stage 2 experiences, visitors reported that the projection displays triggered their imagination and put on display information that was otherwise not available to visitors. Visitors considered the projections to be engaging, particularly when they presented different visualisation (Displays 2 and 3). Kidd (2019) reflects on the 'With New Eyes I See (WNEIS)' project WNEIS in which inaccessible archival information was presented in the form of SAR (Spatial Augmented Reality) at the Civic Centre of Cardiff, Wales in 2014, on the centenary of WWI. It narrated one man's experience of WWI and demonstrated that through projections, people can be engaged with historical narratives and archival material.

Visitors expressed that the projection would also engage children (an opportunity to engage further visitor groups). Engaging visitors with projections at cultural institutions has also been studied in terms of playfulness and interaction for both younger visitors

(Ntalla, 2021) and in general (Basballe and Halskov, 2010). Stage 1 and 2 visitors also noted that the projections allowed group-focused visits as opposed to the VR, where users would experience the recreated Abbey individually. Therefore, visitors reported that the use of SAR facilitates group experiences which also increases perceived experiential aspects of their visit. With respect to engaging children with historical context, a study by Schaper et al. (2018) on Refugi 307 in Barcelona demonstrated that digital augmentation in space enhances our understanding of the past. Refugi 307 is one of the bomb shelters in Barcelona built to shelter people during the Spanish Civil War. The experiment visually and spatially interprets the past. Similarly at St Augustine's Abbey, projection displays at Stage 2 intend to spatially and digitally revive elements of the site that no longer exist on the site. Chapter 5, Section 5.4.2 discusses the experiential aspects of each the projection displays at Stage 2 in detail.

In general, a comparison between visitors' expectations at Stage 2 and experiences demonstrated that 73.34% (n=44) of visitors had relatively satisfactory to satisfactory experiences. The analysis demonstrates that the projection displays in the dark had a positive impact on the site and helped visitors to envision non-existent artefacts. Furthermore, the physical context not only visualised some of the artefacts but also triggered visitors' imagination about the qualities of the demolished artefacts. Participant 202, for instance, mentioned that the changes in the Abbey environment were informative and helped them imagine the artefacts that once existed on the site.

However, despite a notable rate of satisfactory experiences, 26.67% (n=16) claimed that the experience was not satisfactory. These claims came from the older population and reflected on the environmental settings of the experience as opposed to the projection display. This group of visitors considered weather conditions, in some cases the rain, as the main factor affecting experiences by not allowing visitors to experience the projection displays to their full potential.

In terms of the influence of the projections on experiences, participants who attended both Stage 1 and 2 expressed different views. On the one hand, relatively satisfied and well-satisfied respondents said that the projection illuminations in the dark had influenced the physical context of the Abbey, distinguishing it significantly from the ex-

perience at Stage 1. On the other hand, particular participants preferred Stage 1 experiences as Stage 1 experience was focused on interpreting the site's history. Participants with similar comments preferred heritage interpretation delivered through conventional practices in the visitor centre and on the grounds. Visitors involved at Stages 1 and 2 said the scale and characteristics of the digital interventions were not as satisfactory as they expected. The absence of audio and interactive simulations was mentioned causing inadequate satisfaction during the second visit. Therefore, embedding further multisensory interpretations in the projections could enhance experiences and increase satisfaction rates. From the perspective of participants only attending Stage 2, the projection displays did not provide historical information about the artefacts, but they were a "striking" (respondent 516) supplement to such a historical site.

In addition to the transformations made by the displays in the Abbey setting, a number of visitors reflected on the qualities of the materials and methods used in creating the displays. Participants' opinions on the digital interventions on site varied, causing diverse interpretations of the displays and visitation experiences. Chapter 6 discusses the qualities of individual displays, including image quality and visual fatigue, which impact experiences of the site.

4.5 Conclusion

This chapter presented data and discussion on visitor groups participating in the research study at Stages 1 and 2. Discussions drew on heritage experiences considering the personal and physical contexts of the visit at Stages 1 and 2. It presented demographic characteristics of visitors to St Augustine's Abbey and the experience modalities that they attended, namely self-guided, guided tour at Stage 1 as well as Stage 2 experiences where Spatial Augmented Reality projections were installed among the Abbey ruins.

It examined visitors' expectations of heritage visits at Stages 1 and 2. Stage 1 visits grouped visitors based on their expectations according to Falk's (2006) identity-related model. At Stage 1, evaluation of visitor expectation demonstrated that a majority of visitors are 'Experience Seekers'. They generally anticipated exploring the site,

including its remains and relics displays at the visitor centre. 'Experience Seekers' are identified among first-time, returning visitors, self-guided and guided-tour visitors. In the case of Stage 2 experiences, it discusses visitor expectations concerning the altered physical settings at the Abbey where visitors encountered projection displays. Visitors' expectations of Stage 2 experiences indicated that visitors most anticipated seeing the changes digital interventions bring to a heritage setting. Their expectations are dominant around context and contribution of experiencing the Abbey in a different way compared to conventional arrangements (Stage 1).

Comparison between visitors' expectations and experiences in different experience modalities at the Abbey facilitated obtaining the rate of heritage experience satisfaction. Data gathered on observation method of visitors, interpretation provided by English Heritage about the site, and the contribution of projections revealed that they each play a part in informing visitors, fulfilling expectations, and shaping satisfactory experiences.

This chapter presented an ASEB grid analysis of Stages 1 and 2 experiences along with thematic discussions based on the case study's activities, settings, experiences, and benefits. The analysis of Stage 1 experiences drew on guided-tour and heritage interpretations at the visitor centre and on the Abbey grounds. It emphasised the role of the tour guide in providing a dynamic experience to provide interpretation and facilitate better experiences through interaction. In relation to the visitor centre and on the Abbey grounds, this chapter drew on visitor reflections about the benefits of displays and opportunities where experience can be enhanced through closer interaction with historical and archaeological sites. The analysis of Stage 2 experience explored the importance of situatedness and embodiment in heritage settings. It presented visitor perspectives on the added value of projection displays to perceive the qualities of non-existent artefacts and build a more comprehensive image of the site when walking around.

Chapter 5: Visitor-centric evaluation of audio-visual implements

5.1 Introduction

Following the analysis of visitor clusters, expectations, and a variety of heritage experiences at St Augustine's Abbey, this chapter concentrates on the evaluation of a number of audio-visual implements offered to visitors at Stages 1 and 2 of the research. The following section, 5.2, evaluates the audio guide as an interpretation tool for visitors to receive information about the site. It examines the experience of self-guided visitors who opted to use the audio device while visiting the site. The evaluation of the audio guide examines the usability and impact of the device on visitor experiences. By reflecting on visitors' comments regarding the audio guide, this section compares the audio guide modality available at St Augustine's Abbey with other modalities (map-based and location-based solutions) tested in other locations, drawing on features that may lead to different or more efficient heritage experiences.

Section 5.3 reviews the VR experience of the recreated 16th-century monastery. It includes discussions on immersion, interaction quality and experience outcome. By employing the Technology Acceptance Model (TAM), this section introduces a hypothetical model to analyse the relationship between immersion with interaction quality (Perceived Ease of Use), experience outcome (Perceived Usefulness) and age of VR users. It observes the relevance of age and proficiency in digital technologies to navigate and feel presence in a virtual environment.

Section 5.4 presents the data on the SAR projections at Stage 2. It examines the perceived impact and engagement factor of digital intervention in heritage. It observes the three projection displays introduced in Chapter 3 and examines the impact each installation has had on visitors' heritage experiences, understanding and interpretation of the site. It also draws on concerns raised on integrating modern installations in a heritage site. Such views are further discussed in relation to the integrity and authenticity of the site in Chapter 6. Consequently, Section 5.5 presents a comparative analysis of heritage experiences with AR and VR implements for visitors who attended Stage 1 and 2 of the study.

5.2 Audio guides

During Stage 1, participants on self-guided visits were offered the use of an audio guide whilst exploring the site. The audio guide technology at St Augustine's Abbey is a simple keypad selection that allows users to key in a specific number and, in return, receive designated audio content, available in English, French, and Japanese. It directs visitors around the Abbey site, with the first stop located inside the visitor centre leading to many more stops outdoors by the Abbey remains.

The analysis in this section observes the implications of the audio guide on visitor experiences by reflecting on the device as a narration tool and as a spatial navigation aid. Amongst 31 visitors on self-guided visits at Stage 1, 16 participants opted to use the audio guide. Participants in the 65+ age group category showed the most interest in using the audio guide as part of their visit, with 69.23% (n=9) of this age group opting to use it. The audio-guide at St Augustine's Abbey is a keypad selection device. Other models of audio guides, location-based or map-based devices, are not currently offered at the Abbey. Visitors reflected whether the audio guide had a positive contribution during their visit and claimed that the audio guide had a significant positive impact on their visitation experience. They used it as a navigating tool that guides the user from one location to another in chronological order. Therefore, the audio guide supports visitors to explore the site's most historical and archaeological spots during their visit.

However, the significance of using an audio guide has been most predominant in providing self-guided visitors with information about the site and remaining relics on the Abbey grounds. The major positive influence of the audio guide on the visitation experiences, based on the survey results, is that it provides historical information to the users that may not have become available to visitors through other interpretation methods. According to Hughes, Bond, and Ballantyne (2013), interpretation is, in fact, a form of communication that can be delivered in audio, visual and textual formats. It supports people to better understand relics on display, structures of the site and the ruins of which, and historical landmarks during their visit. It performs as a knowledge bridge connecting what visitors already knew before their visit and what they want to learn during the visit. The audio guide narration at St Augustine's Abbey is supplemented by interpretation boards across the site where text and visual information are available to visitors. Participants appreciated the fact that the audio guide narrates the history of the Abbey and its monastic life as well as the introduction of Christianity to the south-east of England, and that it is presented by a number of different voices, including that of the Archbishop of Canterbury.

Similarly, a study on the location-based audio guide about the 1831 Reform Riots in Nottingham (Fitzgerald, Taylor, and Craven, 2013) has shown that by listening to audio guides, participants are able to correlate narrated information with real locations where historical events happened. It enables the audience to reconstruct the historical events in their minds as they visit the specific location of the events. Additionally, this study has also shown the impact on the audience is closely linked with the accent and person narrating the audio guide. A voice with a regional accent or authoritative connection with the site, like the Archbishop of Canterbury, implies a deeper sense of immersion in the local surrounding for the audience.

Visitor comments on the usability of the audio guide specify that the keys on the audio guide device did not function on some occasions. Hence, the visitors would find themselves at a stop not being able to receive audio narration because the output function of the device solely relies on the keypad. In such scenarios, a location-based audio guide could enhance the experience by offering audio narration. Location-based audio guides function with a GPS locator, Wi-Fi, or beacons. The technology detects the user's

specific location and accordingly play relative audio content about the exhibits in the user's surrounding area. Hence, visitors move around the site and locate themselves between the stops. The audio guide plays without relying on keypad entry requests to play. In keypad selection scenarios, users are required to actively locate themselves in the precisely defined spatial area they want to hear about and find the respective audio recording. Alternatively, location-based systems offer audio narration depending on the environment where users find themselves.

Some visitors also reported that despite the audio guide telling them to go to the following location, they missed certain stops. Considering other modalities of audio guides, it can be concluded that a map-based audio guide can improve such experiences. Furthermore, the map-based audio guides provide an overview of the whereabouts of exhibits. Hence, the user benefits from seeing where exhibits or artefacts are located in the physical space, concerning the user's location and in relation to other exhibits. Therefore, reflecting on case experiences at St Augustine's Abbey, it can be concluded that a combination of map-based (digitally or printed) and keypad selection avoids missing out stops. Additionally, it provides visitors with the leisure to choose which audio guide station to play.

The results revealed through analysis of audio guide at St Augustine's Abbey support Wacker et al. (2016) comparison of keypad and map-based devices that rely on users' locations. Wacker et al. (2016) evaluate user experiences of keypad and map-based guides from the perspective of interaction design and usability. They report that keypad audio guide devices have the highest usability ratings, which stems from easy and straightforward interaction as well as users' familiarity with manipulating the device. Similarly, in the case of St Augustine's Abbey, simplicity and straightforward interaction were appreciated by users in general. However, one user reported that the keys on the keypad did not always work. Hence, while maintaining the medium, the device's usability could be improved by enhancing the interaction quality. Furthermore, Wacker et al. (2016) state that visitors appreciate receiving some sort of visual information from audio guides and thus acknowledge the higher information that map guides offer. They based their argument on referring to large settings where visitors may be able to identify and navigate the area without further information on the sites which offer

distanced exhibits or do not include signage. This argument is also valid in the case of St Augustine's Abbey because as the site has come down to its foundations, and visitors do not enter a standing structure or defined pathways, it is difficult to navigate the site in a particular order. Visitors could benefit from a map-based or a visual guide providing geographic indications as to where to find the next stop on the audio guide trail.

5.3 Virtual Reality

The visitor centre at St Augustine's Abbey also offers Virtual Reality recreation of the monastic complex in its 16th- century state. The VR recreation demonstrates both the interior and exterior of the Abbey just before its dissolution. During Stage 1, visitors to the Abbey had the opportunity to experiment with the VR as part of their visitation experience. Among 65 visitors participating at this stage, 47 opted to use the VR. The population of VR users consists of self-guided, guided tour visitors together with first-time and returning visitors.

Table 5.1: Demographic information of the VR users

Demographics	**Guided-tour visitors**	**Self-guided visitors**	**First-time visitors**	**Returning visitors**
18-24 years old	35.29%	52.94%	82.35%	5.88%
25-34 years old	50.00%	25.00%	75.00%	0.00%
35-44 years old	50.00%	25.00%	50.00%	25.00%
45-65 years old	58.33%	16.67%	16.67%	58.33%
65+ years old	12.50%	45.83%	12.50%	45.83%
Total VR users	46.81%	53.19%	57.45%	42.55%

The survey questions on VR, presented in Chapter 3, concentrate on three core aspects of VR experience: immersion, ease of navigation, and the VR's impact in providing users with information about the historic Abbey. Evaluation of the VR on visitor experiences accordingly focused on these three concepts to examine how the design and presentation of VR technology in the visitor centre at St Augustine's Abbey, individually and collectively, influenced visitor experiences. The analysis of the VR is based on the Technology Acceptance Model (TAM) introduced by Davis (1989). The TAM compromises two variables, Perceived Usefulness and Perceived Ease of Use, that are

essential to understanding users' acceptance of a particular technology.

In this analysis, Perceived Ease of Use is employed to examine users' reflections on VR interaction quality and ease of navigation in the virtual environment considering the VR system design and arrangements in the visitor centre. Additionally, perceived usefulness is employed to examine the extent of VR providing the Abbey visitors with information. The following sections discuss the model of correlation between immersion and user age groups with ease of navigation (Perceived Ease of Use) in the VR environment and perceived information (Perceived Usefulness) from the VR, as presented in Figure 5.1.

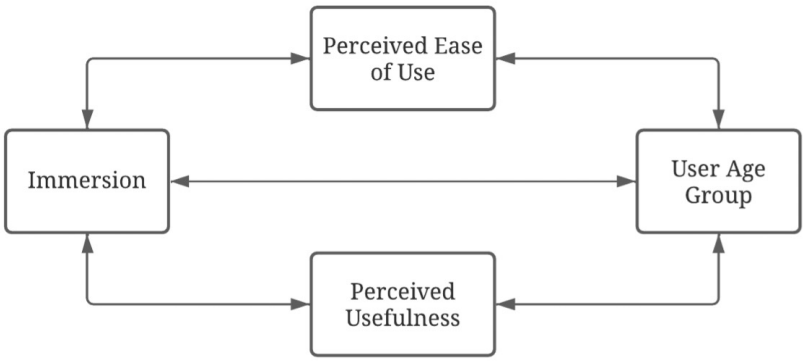


Figure 5.1: Model for evaluation of VR proposed in this research study

Immersive virtual reality is a technology with the aim of fully immersing the user in digitally designed virtual environments. VR users' sense of being immersed depends on the variety of perceptions in the virtual environment; the degree of immersion increases as more real sensations are replaced with synthetic counterparts in the virtual environment (Mortara and Catalano, 2018). Immersiveness, as Slater, Usoh, and Steed (1994) define, is the objective quality of the system to stimulating the user inclusively, extensively and vividly. Presence, however, is the subjective state of the user. In order to improve VR experience outcomes, it is necessary to understand notions related to the presence and at the same time characteristics and abilities of the VR users (McGlynn, Sundaresan, and Rogers, 2018).

In this study, information on immersion in the virtual recreation of the Abbey is gathered to understand the scale of the VR users' sense of presence in the 16th-century monastic complex. Does the 3D modelling and rendering of the historic Abbey include

enough details for users to feel presence in the virtual Abbey? This section presents preliminary data on immersion and the correlation between VR user age and scale of immersion. The degree of VR immersiveness is measured with a nine-point Likert Scale, with one being 'not at all' immersive, 5 being 'somewhat' immersive and 9 being 'very much' immersive. In the analysis of immersiveness, VR users' scale ratings are sorted into three groups. Ratings from 1 to 3 are marked as a low immersiveness. Ratings from 4 to 6 are marked as average immersiveness, and ratings from 7 to 9 are respectively marked as high immersiveness. The overall qualitative results demonstrate that a majority of 45.65% (n=21) of VR users rated it as highly immersive. A second majority of the respondents rated the VR as moderately immersive, followed by 10.87% (n=5) of the study population, who rated it as low immersive. The average scale rating is Mean=6.11 and the standard deviation=1.946. Hence, the majority of ratings, as shown in Figure 5.2, fall between 5 and 7.

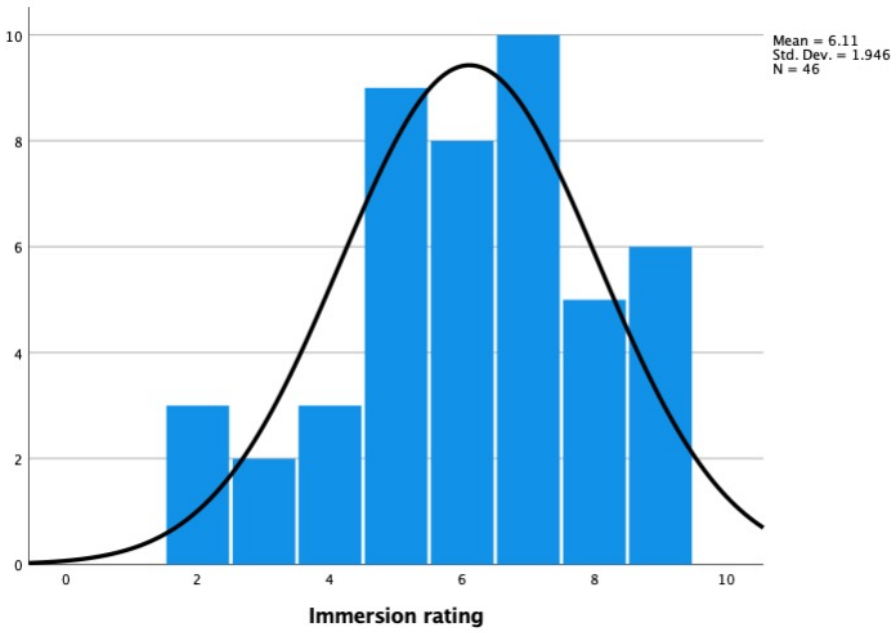


Figure 5.2: Standard Deviation graph of VR immersion rating on Likert scale

The current state of VR systems are used in multiple domains such as learning and education, entertainment, and tourism with designated audiences with particular traits and interests. VR for older adults is substantially dominated around health and psychological assessment of cognitive abilities of patients. Although, as McGlynn, Sundaresan, and Rogers (2018) and Kowalski et al. (2020) state, studies on associations of VR user age on immersion is very limited. This research particularly observes the correlation

between age and immersion to understand whether VR satisfies the broader visitor demographics the Abbey receives regularly.

Immersion scale rating from participant age groups demonstrates that younger and older VR users felt differently immersed in the VR recreation of the Abbey. Users in the 18-24 age group reported the VR as moderate and as highly immersive more than all other age groups. The ratio of 18-24 year olds highly immersed in VR is significantly higher than any other group. The data from senior VR users also demonstrates that a significant ratio of senior users were highly immersed. However, in a comparison of the younger adult users (18-24 year olds) to older adults and middle-aged users (25-44 and 45-65 year olds) and senior participants, a rise in the population of less immersed users is evident. These results support the findings of Bohdanowicz et al. (2020) on VR users' sense of presence from generations X (born between 1965 and 1980), Y (born between 1981 and 1996) and Z (born between 1997 and 2012). They argue that presence decreases in older users.

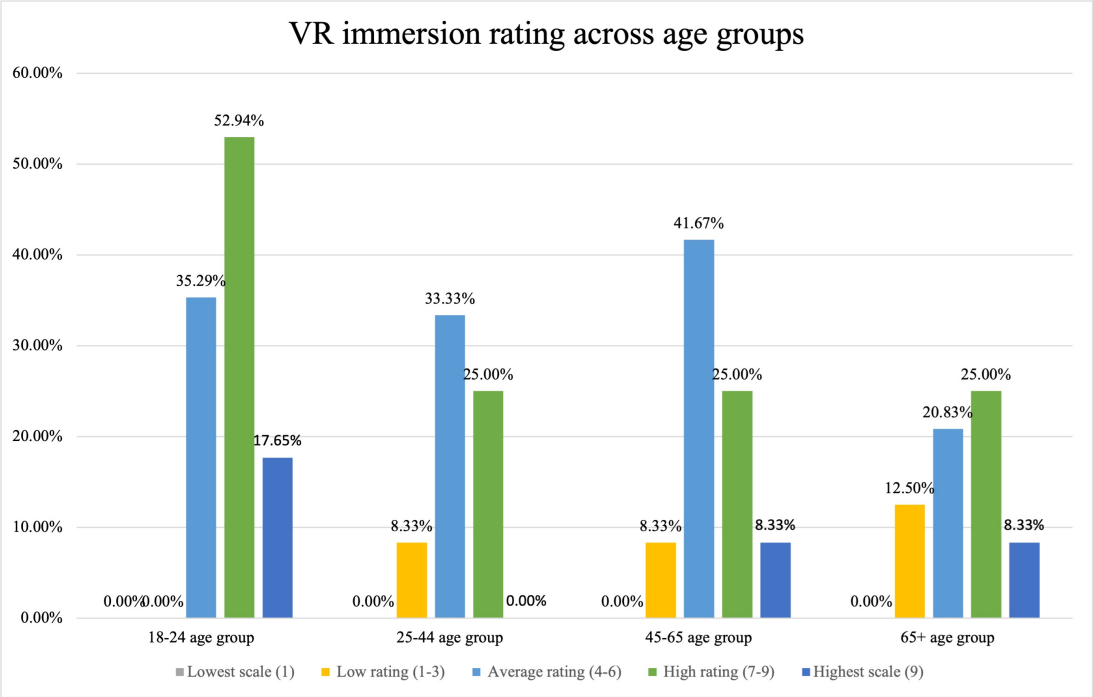


Figure 5.3: VR immersion rating across age groups

5.3.1 Assessment of interaction quality

Interaction quality assessment examines the users' abilities in navigating virtual environments and any physical constraints linked with the VR station setup that may influence the VR experience. The survey question on the interaction quality of VR investigates users' proficiency in finding and accessing the blue dot gaze detectors, which enables travel from one space to another in the virtual environment, and the extent of user challenges in virtual navigation. The VR recreation of the Abbey, as presented in Chapter 3, Section 3.3.1, demonstrates the interior and exterior of the Abbey. However, users' navigation abilities and the number of gaze detectors that they interact with determine the virtual environments they enter or move from one environment into another. In this section, interaction quality is measured against participant age groups. This is due to the fact that, as Silva, Mol, and Ishitani (2019) review in their systematic analysis of VR, older users have less exposure to ICT. They are less oriented to technological advancements. Thus, it is important to identify design elements with constraints or efficacies for wider age demographics, including older adults with less cognitive abilities or proficiencies in using technology.

A broad review of the results indicates that, in general, non-seniors compared to senior users found navigation in the virtual environment easier. Despite similar responses to immersion from the 18-24 and 65+ age groups, the two age classifications had contrary experiences in using the VR headsets and exploring the Abbey virtually. Whilst a majority of 53.33% (n=8) of the 18-24 age group declared that they found virtual navigation easy, 50% (n=7) of the senior population claimed virtual navigation was challenging. In the 18-24 age group, a significant difference between the percentage of respondents who declared virtual navigation easy and challenging is notable. On the contrary, amongst the 65+ age group, even though the percentage of the respondents who declared virtual navigation easy is relatively significant, a greater majority said to have found navigation in the virtual environment challenging.

The data reveals that in older age groups, challenges concerning the interaction quality of VR relate to locating and manipulating the gaze detectors as well as how the experience set-up and instructions provided affect interaction quality. Particular users,

for example, commented that the set-up in the visitor centre has negatively impacted their VR experience. A comment on the static chair in the VR space mentions users' ability to move around and locate the gaze detectors was significantly affected. This challenge could be solved by offering a more open space or a rotating chair for users to move around more freely and be able to identify more gaze detectors in the virtual environment. Furthermore, senior users also mentioned that the basic instructions on the use of VR offered at the Abbey do not fully provide the necessary information on how to work out the system. In younger age groups, it was noticed that users could familiarise themselves with the VR system easier and quicker. However, the analysis provided by the senior age group demonstrated that due to the lack of comprehensive instruction or training, users could not find gaze detectors. Therefore, for this group of visitors, interaction quality was negatively affected.

The findings at St Augustine's Abbey correspond with Roberts et al. (2019) analysis of older adults' VR experiences reporting that despite interest, particular challenges such as difficulty in rotating the head or the body in a way to get the full VR experience, or obstacles in wearing spectacles underneath the VR headset. Mitzner et al. (2010) argue that, despite the challenges that older adults confront in using technologies, the impact of different technologies on their lives is more positive than negative. Accordingly, the analysis suggests that, to improve the interaction quality and accommodate the needs and proficiency of all users design of the VR experience should be at the centre of attention and concern both real-life and virtual environments. As older visitors demonstrate an interest in experiencing the VR, a more intuitive and better-explained experience could enhance the experience. The following section further explains how interaction quality affects immersion in the case of Abbey VR.

5.3.2 Correlation between immersion and interaction quality (PEOU)

This section interprets immersion using qualitative data gathered on VR users' ease of navigation in the virtual environment. Correlation between the two data sets indicates that VR users with hardship in finding the gaze detector and navigating in the VR environment had the least immersive experiences, considering that 3 out of 5 users

reported that the interaction quality is challenging to configure. The majority of cases from this group reported that the VR system is not simple and effective to use. They commented that the instructions provided on using the system were not clear enough. The instructions did not stress clearly enough how to find the gaze detector or focus and choose the gaze detector. As a result, particular VR users could not travel from the outside to the indoors of the virtual Abbey. One respondent from this group did not provide an answer to both immersion and interaction quality. Therefore, the analysis is based on five users.

The results from VR users reporting moderate immersion (20 out of 47 users) in the virtual Abbey indicate that scale of immersion has a direct relationship with user interaction with the system. Around 50% of users said that despite being able to configure virtual navigation methods, they experienced some difficulties. In other words, VR users with a moderate sense of immersion could navigate and travel between the interior and exterior of the VR environment, but, in some cases, particular challenges prevented them from experiencing the virtual Abbey thoroughly. One user found the interaction in the virtual environment so challenging that they could only see around the exteriors of the Abbey and were unable to locate the gaze detector that takes the user from outdoors to indoors. Users who found the interaction quality moderately easy commonly stated that initial experimentation with the system is required to get used to the functions and to locate the blue dot indicators. It can also be time-consuming to configure the gaze detector system and requires clearer instructions on how to use it efficiently.

Although the main challenges with the VR reported by the users related to the embedded gaze detector, a number of cases indicated that the arrangements at the VR station also impacted users' interaction with the VR. The physical environment was also mentioned to have had negatively influenced the experience as with the seating arrangements at the VR station, frequent head rotation to explore the VR thoroughly is not convenient. It limits the possibilities of discovering the blue dot indicators.

However, highly immersed users (21 out of 47) who enjoyed the VR experience the most differ in their comments on the interaction quality compared to other groups.

The survey results indicate that for highly immersed users, interaction is not limited to configuring the gaze detector system. However, they reflect on the interaction based on their personal feelings of travelling in the virtual Abbey. For instance, unlike other groups, particular users mentioned that the walking animation between the ends of the nave in the virtual environment was an uncomfortable, unnatural movement or caused vertigo. Having said that, this was only commented on by a limited number of users. According to Caggianese, Gallo, and De Pietro (2014), efforts in achieving natural interaction has been inclined towards designing virtual experiences where users do not feel they are interacting with a computer. Natural interaction is enhanced by control devices that exploit user gestures and body postures.

5.3.3 VR experience outcome

The analysis of interactive quality and the physical environment of the VR leads to the understanding of the outcome quality of visitors' experiences using the headsets. The outcome quality surveys how informative and beneficial users have found the VR installation. Respondents amongst the 18-24 age group predominantly had the highest rate of satisfaction of the VR, with 86.66% (n=13) positive comments. The survey results demonstrate that users with a positive point of view on the VR found that the VR provided them with a great sense of the scale of its architecture as it demonstrates both the interior and the exterior elements of the monastic complex. The users' report on the VR is, in fact, in line with Pujol Tost and Economou's 2007 explanation of a constructive idea about VR where "visitors are immersed in a scenographic environment, which provides information and simulates actions, sensations and/or was intended since the beginning to be fully immersive, which means the total insertion (both physical and emotional) of the user in the simulated world" (Pujol-Tost and Economou, 2007, p 83). The VR amongst these cases has helped visitors to better appreciate and envision the non-existent artefacts after observing the ruins on site. According to Mortara and Catalano (2018), digital approaches to artefacts are greatly valuable for recreating the original context. Digital recreations where content is not only centred around one artefact but presents how an artefact would have been historically placed aids visitors in a better understanding of what is being viewed. Mortara and Catalano (2018), also rec-

ommend recreating in the original context by stating that viewing a preserved column in a museum cannot be equivalent to viewing a digital recreation of the many columns upstanding in a cultural heritage site.

5.4 Spatial Augmented Reality impact on heritage experiences

5.4.1 Impact of interventions on audience perception of the site

This section discusses visitors' perceived engagement factor and the impact of digital interventions at St Augustine's Abbey. The information presented hereby respectively reflect on data gathered at Stage 1 (before seeing the interventions) and Stage 2 (after seeing the projection displays).

Survey results at Stage 1 demonstrate that, in general, 60% (n=39) of participants considered that digital interventions in-situ could have a positive impact on their visitation experiences. However, the scale of positive to negative and sense of scepticism towards such intervention in heritage sites varies in different age groups. Participants with a sense of scepticism expressed some debatable matters that could positively or negatively impact experiences and should be considered when intervening a heritage site. Younger participants speculate digital installations in Abbey ruins would have a positive impact on their visitation experience, whereas, in older age groups, participants raise concerns about the integration of digital content with historical artefacts.

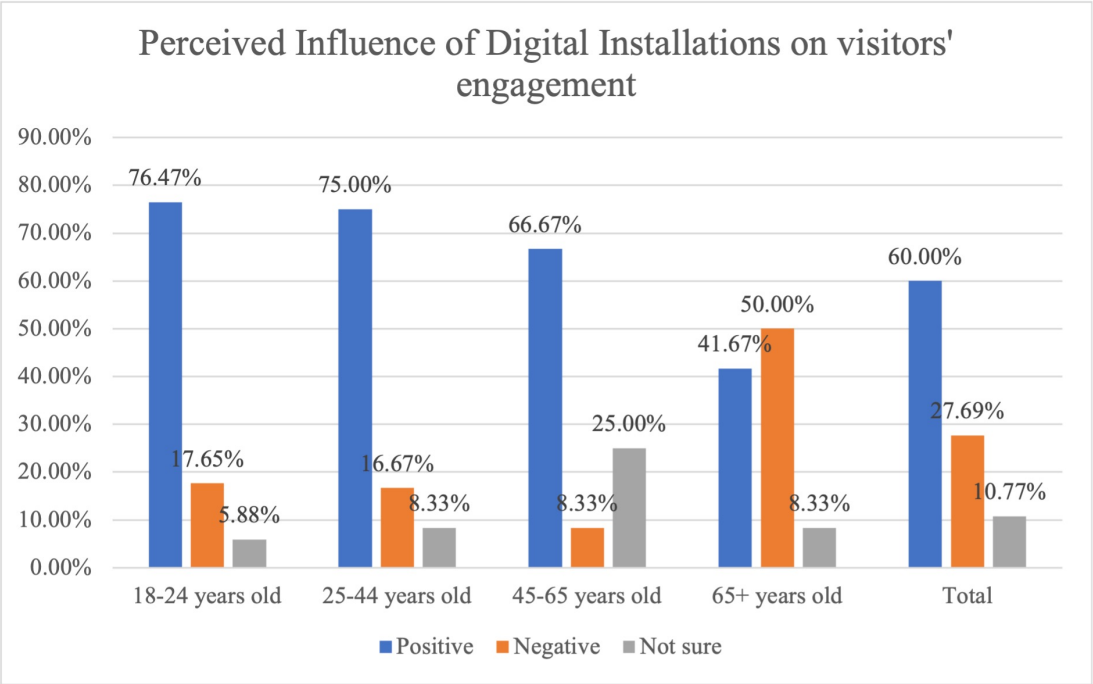


Figure 5.4: Speculation of perceived engagement of digital installation in heritage

Similar to reflections on the influence of visual material presented in Chapter 4, Section 4.4.4, participants with a positive outlook towards digital installations mentioned that they would benefit from such interventions in making a more comprehensive sense of the place when visiting the site. In addition, incorporating installations can also attract a wider group of visitors across adults and children. Conversely, negative attitudes towards intervening in a heritage site with digital installations initiate from the concept that historical sites and modern creation are distinctive and should remain separate. Chapter 6, Section 6.2.3, discusses visitors' concerns about the authenticity and integrity of the heritage site manipulated by installing digital installations in ruins in detail. In addition, participants claimed that digital installation might distract the audience from observing the archaeological ruins or impose a vision about the site instead of allowing visitors to envision the site themselves. This section, explains how visitors negotiate the projection displays at Stage 2 engaging. Subsequently, Section 5.4.2 explains the latter by discussing the qualities and impact of the individual displays.

Visitors' responses about the projection displays at Stage 2 of the study indicate that the engagement factor of the displays is linked to two notions predominantly considering the physical context of the experience and the digital interventions introduced on the site. Based on the data, visitors negotiate the engagement factor for the physical

context of the experience by referring to 1) experiencing the Abbey at night, 2) the experience modality offering further interpretation on the Abbey grounds, and 3) the degree to which intervention could expand the opportunities to see the ruins or obstruct it. In relation to the interventions, visitors' comments correspond with the content of imageries, the atmospheric effect of the display and the projection dynamics (a combination of still, moving and 3D imageries).

An overview of the survey results demonstrated that a majority of 63.33% (n=38) of the night-time visitors indeed found the projections engaging. However, a distinction is evident between how younger and older adults observe the projections as engaging or not. A noteworthy difference is also evident in each age classification between those visitors who did and did not find the projections engaging. For example, 84.21% (n=16) of 18-24 years old visitors found the installations engaging, whereas only 35.71% (n=5) of the 65+ years olds agreed with this. The analysis of data at Stage 2 reveals that younger and older visitors observe interventions in the heritage context differently. Accordingly, their negotiation of whether the projections are engaging or not and based on what criteria differs. The analysis demonstrates that younger visitors negotiate engagement factors based on the collective effect of the experience at night and the individual projections. In comparison, older visitors would discuss either the experience or the projections to justify engagement factors.

The responses from younger groups demonstrate links between the physical context and the interventions. For example, the design and setup of the projection displays were repeatedly mentioned as a key factor for not obstructing the view of the ruins and not interfering with the remaining relics, which resonate with both the physical context of the experience and the projection installations. Additionally, projections are considered as engaging additions to the site that not only put on display a visualisation but also create a more comprehensive image of the Abbey with the non-existent artefacts present. The projections, therefore, had a positive impact on visitors' experiences by reviving parts of the Abbey in an innovative way and providing information about the decorative qualities of the Abbey. On the contrary, responses from the older visitor demonstrate that because they mostly reflect on either the physical context of the visit or the projections, their perception of engagement factor is limited to one

criteria or another and they less see the overall contribution (positive or negative) of the projections.

Based on a study investigating the value of AR at cultural heritage sites, Dieck and Jung (2017) gathered opinions of museum stakeholders' and visitors' opinions on AR, where more than 15,000 visits take place annually. The museum CEO, for instance, arguably considered the incorporation of ICT (Information and Communication Technology) to be a principal strategy for engaging a more extensive range of visitors. Younger and older visitors collectively agreed that integration of technology "bring the museum more to life, attract younger audiences and enhance engagement" (Dieck and Jung, 2017, p 113).

5.4.2 Impact of individual installation on making sense of the Abbey

Participants also referred to a number of intrinsic values of the projections as core engaging attributes. Responses predominantly showed that imagery content, illuminations and visualisation and design dynamics were the centre of attention for visitors. In this scenario, the imagery content presented digitally reconstructed imageries of:

1. A Norman column at the nave area;
2. Pattern and designs of medieval tiles at the Chapel of Our Lady the Angeles and
3. The Pièta graffito on Caen stones on the north side north nave aisle.

The content of each projection was designed to showcase characteristics of non-existent artefacts. In the case of the column base, the visualisations displayed the workmanship of the columns in Norman style as well as the stonework textures and tooling. Visitors found the column base projection most engaging for its visualisation of a 1:1 scale of a column where no other columns remain standing. 15% of comments about the impact of displays directly reference the significance of the column projection on gaining a clearer vision of Norman stonework, materials and the grandeur of the workmanship. As the projection of the column base was displayed just above the remains of the column base on the Abbey grounds, it completed the image that may have once existed. The column base projection was primarily designed to create a holographic effect of the Norman column. The participants expressed their appreciation for the fact that the light beams

not only put on display the projected image of the column but also, as one participant stated, it illuminated the structures behind the display, enabling visitors to view the remains on the grounds.

Figure 5.5: Projection of reconstructed Norman column

Despite the column base display of scale, visitors claimed to have found the projection of the medieval tiles most engaging. 28.88% (n=17) of visitors made direct references to the tiles display, appreciating the colour and vibrancy it brought to the ruins. In particular, visitors thought that direct projection on the remaining tiles was most effective. However, visitors said to have been well engaged with this display for two particular reasons. Firstly, the vibrant colours of the medieval designs were boldly shown in the projections. Participant 218 reflected that "the tiles worked because they were bright and clear. The others were dim and less impressive. The tiles achieved the best effect. The Abbey would have been colourful, so this projection did most to give an impression of the colour in the Abbey when it was in use." Secondly, the projection content displayed tile designs that are not available to visitors elsewhere on site. The projection, as an example, displayed an image of a 16-tiles pattern of which only one tile remains in-situ.

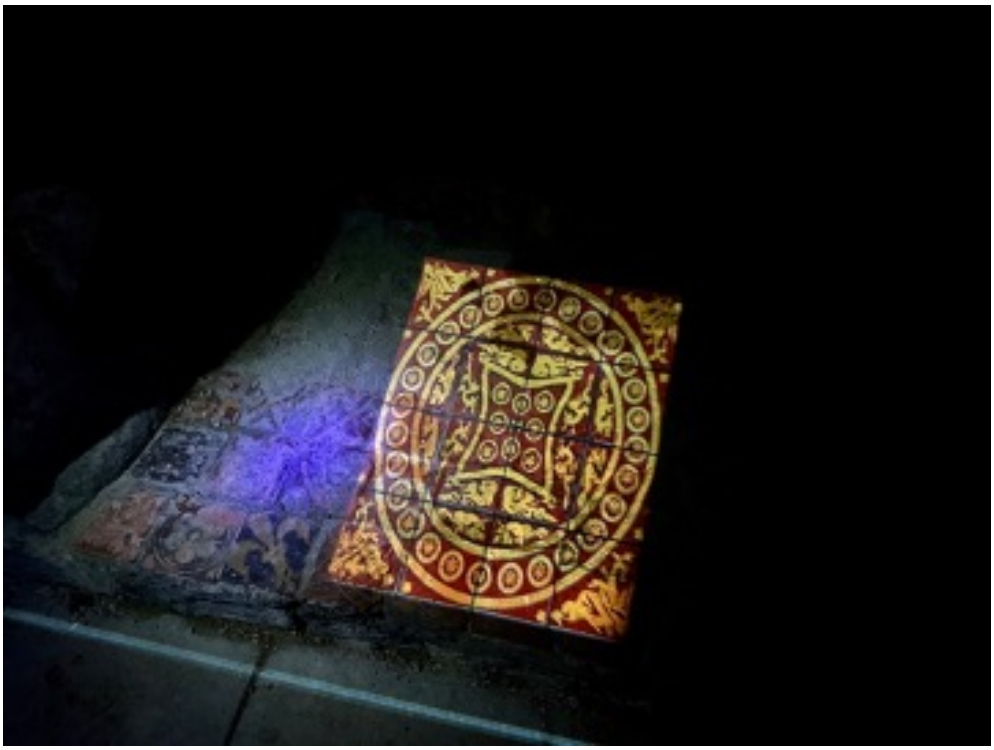


Figure 5.6: Projection of 16 tile pattern

Similar projects that incorporate spatial AR projections in heritage include the interactive display at the Graethem Chapel, Belgium (Nofal, Stevens, et al., 2018) and projections of wall paintings at St Albans Cathedral in the United Kingdom. At both sites, similar to St Augustine's Abbey, the projection mapping technique was used to augment visual information directly on the existing fabric of the sites. Mixed-method evaluations at Graethem Chapel reveals that in-situ projections not only influence visitors' understanding and memorability of aesthetic characteristics of the chapel but also enhances communication of the spatial features of the site when presented on tangible interfaces that remain. Specifically, the discussion from Graethem Chapel reflects that the AR projections, displaying graphics in relation to the Chapel's wall and ceilings, allowed visitors to appreciate the materials, colours and lightings of the building. The interactive feature embedded in this design also provided an added value when visitors could rotate the projector to explore more of the spatial AR.

The example at St Albans Cathedral, accordingly, showcases medieval wall paintings on Norman columns, which were whitewashed after the dissolution of the monastery. The light projections revive colour and forms of figurative wall paintings. Low (2020) emphasises the lasting legacy of the project as it not only produced high-quality imagery

of the wall paintings but also records them for future generations to see as the wall paintings fade over time.

Figure 5.7: The wall paintings in the nave of St Albans Abbey were hidden from view after the Reformation - Copyright: Angelo Hornak

Figure 5.8: Projection of wall paintings at the Nave of St Albans Cathedral - Copyright: St Albans Cathedral

'The revealing flashlight' (Ridel et al., 2014) is another example of spatial AR. The system functions on the basis of spot, distance and angle of the flashlight from the real

object and accordingly presents AR images onto images depending on the relevance of the flashlight with the object. It imposes lost textures and pigments into artefacts. Spatial AR creates an effect close to reality on the Reality-Virtuality continuum (Milgram and Kishino, 1994). This is due to the fact that AR, compared to VR, is closer to the real. Among AR modalities, Spatial AR creates an effect closer to the real. The perceived realism of the displays presented in this section is examined in Chapter 6, Section 6.4.

The projection display of the Pièta, however, did not engage visitors as much. The lenticular design meant that visitors had to observe the projection differently compared to the other two displays. Outdoor weather conditions, occasional rain and wind, waved the projection fabric and so figurative elements did not show to their full potential. As a result, participants claimed that in spite of figurative lines visible on the stone textures, a thorough image as a whole could not easily be identified. Only 10% (n=6) of visitors made direct references to this display as an engagement factor. Participants who engaged themselves in closer observation of the display, however, said to be able to identify figures in the imagery once carved in the Pièta graffito. Participant 516, for example, mentioned that "it almost seemed like you could see human faces in the bricks." For this visitor, projections of the tiles and the Pièta graffito has been more engaging than the column base display, where the illuminations made the remains of stonework visible as well.

5.5 Comparative analysis of SAR and VR installations

The last queries on visitors' experience and engagement of the survey observed the comparative perceptions of visitors toward AR and VR. Participants who took part in both Stages 1 and 2 and experienced both the AR projections and the VR were considered for the comparative analysis. The aim was to gain an understanding of visitors' preference of AR or VR installations that showcase reconstructions of the non-existent artefacts and structures at a heritage site demolished to a great extent. Responses of participants who attended both Stage 1 and 2 of the study and opted to use the VR at Stage 1 (a total of 29 cases) are considered for this analysis.

An overview of the results indicates that participants considered SAR and VR to have their own specific impact on visitation experiences. A majority of 15 out of 29 cases favoured SAR, another 8 cases preferred VR, and five particular cases negotiated the differences between SAR and VR to justify how appropriately the two technologies could be incorporated into heritage experiences. Intervening the heritage site and altering its physical context is a discussion point for participants to appreciate SAR or VR. For instance, participants in favour of SAR collectively stated that the projections provided them with visual insight about the Abbey by overlaying images on the ruins. Thus, it allows visitors to see the sight and the visualisations simultaneously.

It is evident that the sensation of being located in the physical world and observing the real and simulations of the real concurrently was a factor for participants who favoured the SAR projections. The projections did not obstruct the viewer from feeling present in the Abbey grounds as it remains now, whereas VR, by its nature, immerses the user in a different environment. Thus, the visitor can see the visualisations as well as observing and appreciating the site by walking through the ruins. It is a more realistic experience to see the site in person and envision how site-specific visual information presented in the projections relate to the historical structures that once existed.

For instance, participant 418, who favoured SAR, commented on the fact that the projections "added to the building itself, whereas the VR needed you to apply the graphics to the building yourself". In other words, at Stage 1 visits, after the VR experiment, visitors would have to rely on their imagination to realise how the 3D modelling of the site, scale and decorations would have appeared on top of the ruins in reality. On the contrary, some VR users saw projections as a potential obstruction on site. Respondent 206 preferred VR as it does not interfere with the site and allows visitors to appreciate the remains as they are, or it does not require the user to be physically in the particular location.

As said above, a number of cases compared SAR and VR. The responses from these cases distinguished AR and VR based on their prominent characteristics. For example, SAR is effective to show specific artefacts or qualities of the site in the physical context. Nevertheless, VR projects a bigger image of the Abbey. VR can also benefit from

interactive qualities, which makes it even more stimulating. Projections could also benefit from interactive characteristics such as the use of Kinect where projections respond to audience gestures and movements (Sakamoto et al., 2018).

In terms of immersion, participants who tried both SAR and VR found SAR more immersive due to its physical context characteristics and integrated perception of reality. According to Bozzelli et al. (2019), a key fact in overcoming difficulties in virtual settings and perceived realism is to design technologies that can overcome such complications. Along the same lines, the survey results accordingly demonstrated that participants correlated immersion with the perception of realism. A group of respondents explained this metaphor by simply being physically present at the site. With AR, visitors are not physically isolated from the real world as they are when wearing VR headsets. Therefore, the general implication is that AR displays positively influenced visitation experiences.

5.6 Conclusion

Analysis of audio-visual implements at St Augustine's Abbey demonstrates that different technology modalities serve different purposes in shaping a satisfactory experience. Visitor clusters with different expectations may find one technology more efficient and impactful than the other depending on the scale and diversity of information they want to obtain during a heritage experience.

Audio guides are resourceful devices. The audio guide at St Augustine's Abbey provided visitors with audio narration of historical facts about the site and the life and practice at the monastic complex before and after the dissolution. It also acts as a navigation tool that guides the visitor through the site. Integration of map-based or location-based systems in the audio guide could (if incorporated to the site) enhance the experience by informing visitors about the whereabouts of other audio narration or playing relevant narration as the visitor moves from one location to another.

The VR recreation of the Abbey is most helpful in envisioning the scale and architecture of the monastic complex just before its dissolution. It is efficient for visitors

to appreciate the grandeur of the site that once existed compared to the foundations that remain in ruins. Feedback on the immersiveness and interaction quality of the VR suggests that younger users find the system more intuitive. They can configure navigation in the virtual environment more easily and, therefore, explore more of the virtual Abbey. Interaction quality and immersion have a direct relationship; where users felt more immersed in the VR, they could configure the interaction quality easier and vice versa.

Spatial AR projection mappings, as opposed to VR, put reconstructed imageries of the artefacts into physical context. It helps visitors to see the qualities of non-existent artefacts and better appreciate the ruins. Positive feedback on the projections indicates that visitors appreciated being able to walk around the site and, in the meantime, receive a visual interpretation of non-existent artefacts. Evaluation of the projection modalities demonstrates that in-situ holographic displays contribute to imagining a more comprehensive picture of the Abbey without interfering with the ruins or obstructing their view. Direct augmentation of imageries on surfaces are a powerful and vibrant visualisation of artefacts. If executed well, they create an effect close to the real. Lenticular images are helpful to provide a comparison of two images. Whilst the setup enables visitors to explore displays from different angles, the quality and arrangement of the display play a vital role for visitors to negotiate the differences in the images.

Chapter 6: Analysis of perceived authenticity and realism

6.1 Introduction

This chapter discusses the perceived authenticity and realism of digital reconstruction of artefacts presented in the form of projection displays. Chapters 4 and 5 discussed the Spatial Augmented Reality projections on heritage experiences, while this chapter discusses the impact of projection displays on the perceived and experiential authenticity of digitally reconstructed artefacts and the site.

Based on the theoretical framework of Bal (1996) presented in Chapter 2, this chapter discusses the role of the site, visitors, and objects in building narratives around the displays, as well as their contribution to making sense of the heritage site. Section 6.2 explores the notion of authenticity defined and perceived by visitors at St Augustine's Abbey. It draws on theoretical approaches where authenticity is observed in a materialist manner or as a result of a social construct. Accordingly, it evaluates whether visitors to St Augustine's Abbey negotiate authenticity in objects or interpret it in a broader social and physical context. This section predominantly explores the cues visitors make in justifying the authentic and the inauthentic. Furthermore, based on the historical and philosophical discussions, it debates concerns around the perception of authenticity or inauthenticity of reconstructed artefacts in the heritage context.

Section 6.3 debates the realism and hyperrealism of projections. It discusses light and

projections as forms of intangible realities that define spaces in the tangible world. Based on the philosophy of Baudrillard (1994), this section debates visitors' perceived (non)realism or hyperrealism of projection displays. It explains that if projections are not real, their hyperreality originates from representing or simulating reality. This is followed by a discussion on how hyperreality is justified against reality and how do visitors to the differentiate the real from the hyperreal.

Section 6.4 presents an analysis of how visitors perceived authenticity and realism of visual presentation of the non-existent heritage in the form of digital projections. The analysis is based on the three Spatial Augmented Reality projections installed at St Augustine's Abbey as part of the Stage 2 experiences. It introduces holographic projections,, image augmentation and lenticular images as means for visualising digital reconstructions of heritage on site and in-situ. This is followed by an examination of participants' perceived authenticity and realism of individual projection displays upon encountering them as part of Stage 2. It examines the correlation between perceived authenticity, image quality and perceived realism. Additionally, it evaluates the impact of image quality in heritage visualisation on perceived realism and elaborates which visualisation approach best accommodates the purpose of showcasing digital reconstruction in a heritage context.

6.2 Authenticity in the case of reconstructed artefacts

6.2.1 Constructivist approach towards authenticity

In this chapter, the analysis of authenticity is based on Bal's (1996) exposition theory that includes three personas: the expositing agent, visitors, and objects. Bal's (1996) framework, as formerly presented in Chapter 2, justifies each persona's roles in relation to one another and in shaping experiences. The first person is the 'expository agent', and the second is the viewer. It facilitates an experience by providing information about their display content to the viewer, thus initiating dialogues. Although it does not participate in the dialogue, the third is a crucial element. Narration is shaped through presenting or exposing an object whilst providing information about it to construct a

connection between the present state of the object with its history of making, function and meaning. Narration is also generated through walking tours in museums where the link between exposition elements is created.

This analysis is an attempt to gain an understanding of how visitors to the Abbey define authenticity in the first place. Is authenticity inherent in objects with historical or archaeological roots? Or is it perceived as how one interprets an object? Jones (2009) argues that approaches to authenticity constitute a dichotomy in 'materialist' and 'constructivist' approaches. The materialist approach involves observing the object in a very objective fashion. It predominantly engages with the 'fabric' of the object and investigates authenticity in its origins to find the truth that is or once was. On the contrary, the constructivist does not find authenticity as a quality inherent in an object but as a quality that is 'culturally constructed' and can vary depending on who is observing the object, and in what context (Jones, 2009). The constructivist approach to authenticity is a precedent of the modern definition of authenticity after The Nara Document on Authenticity (1994).

Accordingly, Wood (2020) discusses the term authenticity from multiple perspectives. Wood (2020) argues that authenticity should be viewed through consideration of a combination of object-centric and constructivist approaches, but also with respect to personal experiences and changes in the situation. Based on Cohen's evolving definitions of authenticity (Cohen, 1988), Lau (2010) argues that authenticity is a social construct that is subject to negotiation.

In this section, the constructivist approach towards authenticity is employed to understand how visitors to the Abbey perceive authenticity during visitation experiences. This evaluation is specific to Stage 2 experiences where, compared to conventional visits at Stage 1, the physical context of the site, subsequently, observation and navigation routes at the Abbey and the displays differed substantially. Despite the numerous transformations on-site during Stage 2, visitors articulated that they nonetheless authenticate their experience based on a network of connections they make with remaining relics, the digital interventions and the site itself. Therefore, the authenticity of the visitation experiences is perceived through the contextual processes in which visitors

observe the Abbey. Thus, visitors do not compare the conventional arrangement of the Abbey during Stage 1 with physically altered settings at Stage 2 to define which is authentic and which is inauthentic.

Visitors claimed that they count heritage experiences at Stage 2 as authentic since they were provided with an opportunity to explore the site in novelty. In this scenario, authenticity lies in the genuineness of the experience. In particular, visitors referred to Stage 2 experiences as an unusual experience, authentic in its explicit way and evidently not comparable to the ordinary image of the Abbey one would have in mind from visiting the site during Stage 1 or on a daily basis. This statement explains that authenticity from this perspective is not just found in a defined or specified condition but can be sensed through unconventional ways of experiencing the Abbey. Even though authenticity from a theoretical perspective is a complex subject, perceived authenticity for visitors could be as simple as having a genuine visitation experience.

The digital reconstructions illuminate the relics and thereby reveal an additional dimension of the site in the dark, which is not conceivable during the daytime. However, for many visitors, the question here is whether reconstructed imageries are authentic enough to be installed near historical ruins. Would integrating reconstructed imageries on site devalue the perceived authenticity of the Abbey? Reflections on survey responses indicate that the more the digital displays blend in with the site, the more authentic the visitation experience becomes. In all cases, the appropriateness and relevance of the projection displays are fundamental. Visitors at Stage 2 explained that the perceived authenticity of their visitation experience derived from their interpretation of the authentic or inauthentic site, the displays, and their justification of the two notions. Even though some visitors claimed to perceive their visitation as a cultural construct, many still used concepts close to the materialistic approach in defining their visitation as authentic. For example, a number of visitors claimed it was the collective effect of the projections and comparison of the digital interventions with the remaining relics that led to an authentic experience.

6.2.2 Cues for authenticity

The analysis in this section refers to data gathered at Stage 1 of the study. This section evaluates visitors' perceptions of the authenticity of digitally reconstructed imageries. Based on the data gathered during Stage 1, it investigates whether visitors acknowledged reconstructions of non-existent Abbey artefacts as authentic or inauthentic. It examines the criteria and qualities visitors associated with authenticity and the cues that lead them to distinguish the authentic from the inauthentic.

The survey results indicate that a majority of the participants (52.31% (n=34)) attending Stage 1 of the study acknowledged digital reconstructions as authentic. Although a significant number of participants commonly considered an attempted reconstruction to be authentic, the cues governing participants' judgement of authenticity demonstrate the variety of themes affiliated with the quality of being authentic. Around one-fifth of the participants said that perceived authenticity for them was directly linked to their faith in the truthful representation and accuracy of the reconstructions. Therefore, if reconstruction of an artefact is wrought based on satisfactory research and approved by historians or specialist personas, it was perceived as authentic. Authenticity, in this scenario, is not perceived first-hand but as a result of artefacts or displays being authenticated by whom the visitors trust. Hence, a sense of scepticism in the precision of the reconstructions leads to perceived inauthentic sentiments of the reconstructed artefacts. Such results are supported by the analysis of Hede, Garma, et al. (2014) in a study on the perceived authenticity of visitors' experiences, where they conclude that visitors with lesser levels of scepticism and more hedonic expectations perceive authenticity to a higher degree.

Additionally, participants at Stage 1 associated authenticity with the qualities of reconstructions. According to the 'Operational Guidelines for the Implementation of World Heritage Convention' (2021), authenticity is credited to heritage, based on a variety of attributes, including those that originate from the traditional criteria to concepts introduced in The Nara Document of Authenticity (1994). The Nara Document does not purely find authenticity in the artefacts in the material qualities of artefacts. It observes authenticity according to developments of the cultural heritage in time. The

question is whether digital reconstruction in a historical context is observed similarly to physical and material reconstructions. The Nara Document (1994) supports perceiving authenticity of cultural heritage in relation to progressive alterations or reconstructions.

Would the Nara Document also extent to the authenticity of digital reconstruction and their integration in heritage settings or does it only reflect physical reconstructions? The following text discusses how digital reconstruction of cultural heritage can depart from material to digital. At the age of digital visualisation of cultural heritage, 'The London Charter for the Computer-based Visualisation of Cultural Heritage' (2006) introduced principles to ensure that digital visualisations of cultural heritage are intellectually and at the same time technically thorough. The 'Aims and Methods' principle of the London charter highlights that computer-generated visualisation of cultural heritage should solely be incorporated when it is the most convenient method. Moreover, the 'Access' Principle of the London Charter indicates that computer visualisation of cultural heritage should be developed in a way to ensure that the "outcomes of 3d visualisation work could contribute to the wider study, understanding, interpretation and management of cultural heritage assets"(The Centre for Computing in the Humanities King's College London, 2006, p 12).

In the case of a digitally reconstructed artefact, the concern for authenticity, as articulated by 11 out of 65 visitors in St Augustine's Abbey, is whether the reconstruction is wrought according to standards. The standards apply to the characteristics of the digital reconstruction and, more importantly, the content that is put on display. A digital reconstruction is required to be fashioned in an appropriate manner that maintains high-quality standards and, in the meantime, presents a factual, detailed and precise visualisation of the non-existent artefact. Hence, digital reconstructions are authentic, bearing in mind their postmodern features in terms of form and design, even though they replicate historical artefacts. Moreover, although authentic materials of non-existent artefacts are not tangible in the digitally reconstructed forms, clear visualisation of the materials and methods incorporated in creating the artefacts is considered as an authentic way of reviving them in the particular context of digital heritage.

Furthermore, participants at Stage 1 tended to perceive digital reconstructions as au-

thentic in the absence of the original cultural heritage artefacts. Four participants directly refer to this point as a prominent notion. This statement leads to the understanding of two notions: 1) Due to the absence of the original, the reconstruction cannot be compared with the original. The authentic and inauthentic cannot be distinguished. Therefore, the reconstruction is perceived as authentic. 2) The reconstruction provides the visitors with cues about the qualities of the non-existent artefact. It replicates the qualities of the original authentic.

The results at St Augustine's Abbey are comparable to Duval et al. (2020) study on heritage experiences of rock art replica at Cave of Chauvet 2 in France where they examined the distinction between the fakes and the real in reconstructing heritage and demonstrated that in the case of Chauvet, the replica stands for the original. Duval et al. (2020) observe to what extent the characteristics of the replica lead visitors to experience features that define the original. Cave of Chauvet 2 was built in 2015 as a replica for Chauvet-Pont d'Arc which was inscribed as a World Heritage Site in 2014 and is closed to visitors. Similar to the statements 1 and 2 at the Abbey introduced above, the results indicate that, the replica is perceived as authentic because it "forges a relationship between the public and the world of their origins, thus confirming its heritage function. As the replica is a place where visitors may have a heritage experience, linked to a feeling of authenticity, the results of our public survey confirm an extension of heritagity between the original and the replica" (Duval et al., 2020, p 157).

Figure 6.1: The fresco lion at Cave Chauvet 2 - Copyright: Sébastien Gayet

In searching for the authentic that no longer exists, visitors authenticate the reconstructions of the original. Accordingly, it is through encountering the recreations and perceiving them as authentic that one learns about the authenticity of the original. This is also evident in a study by Hede and Thyne (2010) on perceived authenticity at the literary heritage museum of '56 Eden Street' where replicate artefacts are present. The study aimed to identify how visitors debate the inauthentic. Their results demonstrate that visitors need to encounter the inauthentic while they search for authenticity in artefacts.

Secondly, the reconstruction is created based on presumptions made upon the pieces of evidence of the non-existent artefact. It is, therefore, as close to the real artefact that once existed based on the observation of evidence. The justification made here reflects that participants at Stage 1 (7 cases in total) considered the content visualisation of digital reconstructions to be 'authentic considering the relation between the original and the reconstruction. Grayson and Martinec (2004) define indexical and iconic authenticity as two variations that result from replicating the original. To Grayson and Martinec (2004), authentic relates to 'the original' or 'the real' and not an imitation of another. They define duplicates that have a spatio-temporal link with the original

as indexical authentic. However, they explain that iconic authentic are considered to be similar to or resemble the original (Grayson and Martinec, 2004; Hede and Thyne, 2010; Hede, Garma, et al., 2014) and that, often iconic and indexical authenticity are negotiated in relation to one another. In the case of St Augustine's Abbey, participants at stage 1 stated that reconstructions could be negotiated as iconic and/or indexical authentics if they demonstrate links to the original and manifest some of its qualities.

6.2.3 Issues around inauthenticity

Despite the noteworthy belief in the authenticity of digital reconstructions, 13.84% (n=9) of the Stage 1 population stated that digital reconstructions are, in fact, not authentic. Only in four cases, participants associated authenticity with originality and genuineness. From this perspective, only the artefacts that once existed are authentic, and as a result, reconstruction of a historical artefact is not authentic, as it is not the original. Their justification is similar to Riegl's (1982) point of view on the historical value of cultural monuments based on the fact that anything that occurred or was created in the past has a historical value and cannot be replaced. As Philippot (1972) declares, every artefact with historical value is unique and impossible to replace without falsifying it. Jones (2009) comparably exemplifies photography as a reproduction in which the unique existence of the original is lost.

The dichotomy caused by materiality in observing authenticity can be exemplified by discussing the reconstruction of Buddhas of Bamiyan, which were destroyed by an act of war. The buddhas and their substantial materiality are lost. The dispute on (not) to reconstruct the buddhas can be exemplified in justifying visitors' point of view on not reviving St Augustine's Abbey non-existent artefacts. The Abbey and Buddhas of Bamiyan both have lost their material identity. The reconstruction attempt of the German branch ICOMOS was put on as a result of contradicting 'The Venice Charter' (1964) article 9 on the use of original material for reconstruction of cultural heritage sites. The same concern is addressed in the case of reconstruction of St Augustine's Abbey. The question is whether it is appropriate to reconstruct when the original material is not available or involved? Similarly, authenticity or inauthenticity is perceived

as a result of visitors' ability to establish a relationship with the object. Jones (2009) states that the materiality of the object is fundamental, not in a materialist sense, but because the object's materials embody its past experiences and aid connecting the visitor with its history. This statement, however, is arguable in relation to heritage sites that were recognised or listed after their destruction. As an example, the 'Cultural Landscape and Archaeological Remains of the Bamiyan Valley', Afghanistan was only inscribed as a World Heritage in Danger in 2003 UNESCO (2003), two years after UNESCO failed to halt deliberate destruction of the Buddha statues in the valley by the Taliban.

Holtorf (2013) explains the relationship between materiality and authenticity of historic objects. He denotes that Jones' constructivist approach towards authenticity observes authenticity in relation to the history and pastness of the object. Authenticity in relation to materiality can be discussed from both materialist and constructivist approaches. As Holtorf (2013) addresses, the pastness of the object can be observed differently. The materialist approach is taken into account if the materials and substances used to erect the archaeological object and the influence of decay and degradation becomes the centre point. Visitors' observation of the authenticity, in this case, is inclined more towards the materialistic approach as opposed to experiencing pastness through their observation of the historic environment.

The reconstruction of heritage post destruction, especially post-conflict destruction, pays attention to reviving the values and spirit of the heritage place. Alike the Buddhas of Bamiyan destructed by the Taliban, Mosul has been significantly damaged by the deliberate act of the Islamic State (Isakhan and Meskell, 2019). UNESCO, in 2018 after three destructive years of conflict in Iraq, launched the 'Revive the Spirit of Mosul' project. The project aims to reconstruct the Old City of Mosul that, according to Isakhan and Meskell (2019), can contribute to the city's future. However, Isakhan and Meskell (2019) express that continued negotiation with the local population and involving them in the process, despite their contradictory views, is key. They also emphasise the necessity of examining and documenting how local people perceive and interpret the destruction of cultural heritage and its reconstruction which reiterates the value of having access to public's opinion on heritage places and reconstruction. Whilst

St Augustine's Abbey is not a post conflict site, reconstruction of demolished artefacts could impact visitors' perceived spirit of place. The analysis presented in this chapter intends to understand the impact of reconstruction on how visitors' negotiate the site and its historical value.

In addition, a number of participants visiting the Abbey at Stage 1 suggested that the site remains authentic if the archaeological relics are not intervened. Henceforth, based on the comments of these participants it could be argued that displaying reconstructed artefacts amongst the ruins takes away the authenticity of the site. The historical value of a monument, according to Riegl (1982), increases if it sees fewer integrations and exposes the original state of the monument more. The issue with interventions not only concerns the historical site's context but also its own. Context refers to the proximate surrounding of an object which is significantly influential in how the object is interpreted (Philippot, 1972).

Consequently, concerns around reconstruction and in this scenario, firstly, stress inappropriate intervention in a historical site, and secondly, inexplicable incorporation of the reconstruction where it does not best fit. The question is how much intervention could impact the authenticity and integrity of the site, particularly at vulnerable sites. At Stage 1 participants' views on the inauthenticity of digital reconstructions entail that they believe such designs are misinterpretations of the age value of the artefacts they represent. This statement, however noteworthy, was only mentioned by two at Stage 1. The age factor and decay of artefacts in terms of form, colours and stone tooling are not apparent in a reconstruction that attempts to put on display a perfect and complete image of the artefact.

Furthermore, 27.69% (n=18) of the Stage 1 population expressed their doubts about the authenticity of digital reconstructions. A sense of scepticism in the authenticity of digital reconstruction arises from the fact that no matter how close the reconstruction is to the true reality, there are always qualities that prevent it from being thoroughly acknowledged as authentic. A particular concern in this matter is that reconstruction, in any manner which is wrought, does not revive the non-existent. It conceivably is in its very form and context accurate and true to reality but can never achieve the

authenticity of what it stands for. The role of the restorer is critical in this process as it can impact the reconstruction to be manipulated in a subjective manner. As much as the reconstruction is unquestionably close to the original, it never entirely achieves the authenticity of the original.

Participants also correlated authenticity with the impact that reconstruction of non-existent artefacts has on appreciating the ruins. The results show that reconstructions, in this case, are considered to be authentic if they appropriately are set up amongst the ruins and aid visitors to envision the non-existent artefacts and interpret the remains of the Abbey better.

6.3 Perception of realism and hyperrealism

6.3.1 Projections: Intangible realities

This section draws on the perceived realism of projection displays. It is based on visitors' statements that define projection as real before encountering them at the Abbey site. The perceived realism of projections understandably is correlated with how visitors sensed intangible or tangible aspects existing in the real world. Perception of realism of the projections, as explained by the participants, extends to the limits of existence. Illuminations are an overlayer of visual imageries in the physical world. They exist and can be sensed. Therefore, they are real. Reality is not required to be present in a tangible form.

What makes projections real is that they can be seen and encountered. Their existence not only simulates the spatial dynamics of their surrounding environment but can also be influenced by human interaction. Even though light, in essence, is intangible, it is commonly incorporated in creating physical spatial dynamic experiences and boundaries. Lovell (2018) and Lovell and Griffin (2019) explore projections and hyperrealism in their work. Projections, diffusion of light arrays, are perceived as real as a result of influencing one's perception of the surrounding environment and defining spaces even though in a non-materialist way.

Moreover, participants have said that it is the very intrinsic characteristics of the projections that imply a sense of reality, more specifically, intangible reality. Immersion is an example of intangible reality where one can sense being transitioned into another environment purely under the presence of simulating lights. Consequently, from this perspective, projections are perceived as real. However, elements projected in them are believed to be simulations of reality.

6.3.2 Hyperrealism

Whilst participants of the study justified perceived realism of the projections based on the intrinsic values of light and the spatial dynamics, 69.23% (n=45) of the participants said that projections are not real. This section examines a variety of the public's understanding of the quality of not being 'real' based on the terminologies of Baudrillard (1994). The analysis is based on the assumption that participants do not have particular knowledge about Baudrillard's philosophy. Baudrillard's terminologies are, however, used here to better articulate the statements made by the participants about the qualities of not being real.

Grounded in participants' opinions, the content of projections are merely imageries. Digital reconstructions of heritage artefacts, presented in the form of light projection, are therefore only imageries of the historical realities. On that note, projections are predominantly a visual means for delivering information about (a past) reality. Thus, they do not replace reality and are distinctive from the real. Projection imageries are realities that can be created over and over. This epistemology explains Baudrillard's hyperreal, which is defined as reproductions of the reality without a particular reality or an origin. According to Baudrillard (1994), the hyperreal is not necessarily required to be rational because it nor will be compared to the real neither imitates the real.

Even though participants' understanding of projections as 'not real' evokes their awareness of hyperreality, as opposed to reality, it is somewhat unclear whether they acknowledged projections as a 'representation' or 'simulation' of the real. The survey results show that the general understanding of the two notions of representation and simulation is that they both, to some extent, imply a sense of reality. However, to

Baudrillard, to "simulate is to feign to have what one doesn't have" (Baudrillard, 1994, p 3). Representation originates from the concept of the equality of "the sign and of the real" (Baudrillard, 1994, p 6). The analysis demonstrates that visitors principally use both terminologies of simulation and representation in negotiating and differentiating the unreal from the real. Accordingly, it can be concluded that perceived hyperreality is based on the assumption that projections are illusions of reality. Projections are simulations of reality instead of representing reality.

However, particular cases determined projections as hyperreal on the grounds that the content of projections are representations. Perceived representations understandably varied for the participants. The differences in explaining representational attributes of projections arose from how close and related the projection content is to reality. According to Baudrillard (1994), an image has four phases, from being a representation of a 'profound reality' to becoming a 'simulacrum' that has no relation to any reality. The third level of the image, as Baudrillard says, conceals the lack of deep reality. Explanations made by the participants accordingly articulate that to them, projections in the heritage context, are representations because, if well designed, they revive history through imageries that fill the gap of non-existent Abbey artefacts.

6.4 Evaluations of digital heritage visualisations

6.4.1 Perceived digital authenticity and realism

Display 1 Display 2 Display 3

Figure 6.2: Projections displays at Stage 2

Following discussions on authenticity and realism, this section investigates these notions in further detail by examining perceived authenticity and realism of the heritage

visualisation methods installed at St Augustine's Abbey as part of Stage 2. The analysis evaluates to which extent visitors to the Abbey find projection displays of heritage visualisations authentic or real. Additionally, it examines the relationship between authenticity, image quality and perceived realism.

It is evident that visitors' perception of authenticity and realism differs when they reflect on the two notions independently as opposed to when they negotiate the two terms in relation to a particular subject. Based on the survey results, visitors perceived the authenticity and realism of projection displays correspondingly, although projections were considered as hyperrealities representing or simulating the real. However, in this context, projections were acknowledged as real once perceived as authentic by the viewers. Realism was sensed when visitors acknowledged the projection displays as authentic. Jones et al. (2018) also report such findings as a result of investigating authenticity in relation to visualising as part of the Accord Project (Archaeological Community Co-Production of Research Resources). Jones et al.'s (2018) examination of authenticity did not concern notions such as accuracy or realism of digital visualisation per se but how they inform negotiating authenticity.

Upon encountering projection displays, the authenticity of a digital visualisation is not negotiated on its own or in comparison to perceived realism or hyperrealism. Reflections on the visitors' comments suggest that in cases where authenticity is negotiated in a constructivist approach, realism is perceived to a higher degree. Additionally, realism is also perceived to a higher degree in cases where the projection display is perceived as authentic and convincingly believable. As Jones et al. (2018) state, the fidelity of digital visualisation is a key point in vindicating concerns about the accuracy of digital reproductions. Initial reactions to the digital models created in the Accord project indicates that realism or hyperrealism is seen through the visual aesthetics of the digital model. According to Jones et al. (2018), authenticity is how realistic or close to realism the digital visualisations are erected.

Table 6.1: Statistical summary of perceived authenticity of projection displays

Authenticity	N	Min	Max	Mean	Mode	Std. Deviation
Display 1	59	1	9	5.46	5	2.17
Display 2	60	2	9	7.05	8	1.59
Display 3	59	1	9	5.41	7	2.24

Table 6.2: Statistical summary of perceived realism of projection displays

Realism	N	Min	Max	Mean	Mode	Std. Deviation
Display 1	59	1	9	5.08	5	1.98
Display 2	60	2	9	6.73	8	1.87
Display 3	59	1	9	5.15	7	2.16

The question which the case study at St Augustine's Abbey aimed to answer is which projection methods conveys a higher sense of authenticity and realism to visitors. Tables 6.1 and 6.2 present statistical analysis (which includes Mean, Mode and Standard Deviation) of perceived authenticity and realism of the three projection displays at Stage 2. The statistical analysis reflects on 60 ratings in the range of 1 to 9 on a Likert scale, where 1 is the lowest and 9 is the highest. In some cases, the number of valid data is less than 60. The scale rating was offered for each display for authenticity, realism, image quality and visual fatigue caused by the projection criteria. An overall realisation of the scale ratings demonstrates that in the cases of all three projections, perceived authenticity and realism varied extensively on the scale range. For the purpose of analysis, scale ratings from 1 to 3 are considered low, 4 to 6 are considered moderate, and 7 to 9 are respectively considered as high. Despite the fact that participants' rating on perceived authenticity and realism varied on the scale range, the Mean figures (as presented in tables 6.1 and 6.2) in each case demonstrates that the rating stands in the semi top tier. Comparison between scale ratings of perceived authenticity and realism amongst the three projection displays supports the former discussion that authenticity and realism are perceived accordingly and in relation to one another. The Mode figure for authenticity of display 1 is 5. For display 2, the Mode figure for authenticity is 8 and for display 3 Mode figure for authenticity is 7. Mode figure for realism of each projection displays 1 to 3 are 5, 8 and 7 respectively. Correlating Mode figures of authenticity and realism for each projection display demonstrates that if a display is rated as moderate or high in greater numbers for perceived authenticity, the

same rating pattern follows for perceived realism.

The perceived authenticity of projection displays as a result of visitors' constructivist approach towards digital reconstruction (Section 6.2.1) and realism (Sections 6.3.1 and 6.3.2) is evaluated based on their integration in the physical world and the material fabric of the site. Therefore, realism, in this case, is not solely justified by comparing the projected imageries with the remaining artefacts in terms of physicality. Conversely, it is sensed in how naturally projected imageries blend in the site. Hereby, this section discusses this subject in relation to the three projections displays introduced in Chapter 5.

6.4.1.1 The holographic effect

Display 1 created a holographic effect of a Norman column base. Incorporating holograms in cultural institutions such as museums and heritage sites expands opportunities for further visual interpretations of content. The advancement of the holographic technology in recent years has made simulating realities, personas and artefacts that no longer exist possible. In the particular context of heritage visualisations and virtual museums, holograms are extensively used to revive and put on display objects of historical value that are not physically accessible for the visitors to observe (Hammady et al., 2021; Pollalis et al., 2017; Sarakinos and Lembessis, 2019)

The survey results show that the holographic effect of the Norman Column was mainly perceived as moderately authentic. The characteristics of the holograms determine how authenticity and realism are perceived. The authenticity and realism of this projection are evaluated based on a characteristic of a mid-air visualisation of the column base. The difference between the projected image of the Norman column and similar columns upstanding on the site becomes prominent when compared in relation to physical and structural elements. The criterion which makes the projection less authentic or real for visitors lies in visitors' interpretation of the display as a hologram.

Despite the fact that the holographic projection display visualised reconstructed imagery of the column, it created a mid-air illusion of the artefact. Hence it was perceived

as less believable. Outdoor environmental conditions such as wind blowing the projection fabric were mentioned as a criterion that made the projection less real. As the wind affected the display, the idea of non-realism became more prominent, thus the image in front the viewer became increasingly illusionary. A reconstructed image of the column, even though photorealistic in design, was perceived as hyperreal. The hologram, as Pietroni et al. (2019) state, brings virtual reality into our world without requiring us to immerse ourselves in it.

However, as visitors at Stage 2 articulated, authenticity and realism are perceived through comparison between the relics with similar features and the reconstructed imageries. For example, visitors mentioned factors such as resemblance in stone textures and tooling helped them authenticate whether the projection display is a true representation of the Norman column. Realism, respectively, is also perceived through comparing form and the scale of the stonework in the reconstructed imagery with the proportions of the remaining relics. Visitors evaluated realism in the holographic display against the historically and tangible realities that remain in-situ. The upright standing reconstructed image of the column on the site constructs an intangible spatial dynamic space which leads to a perception of reality.

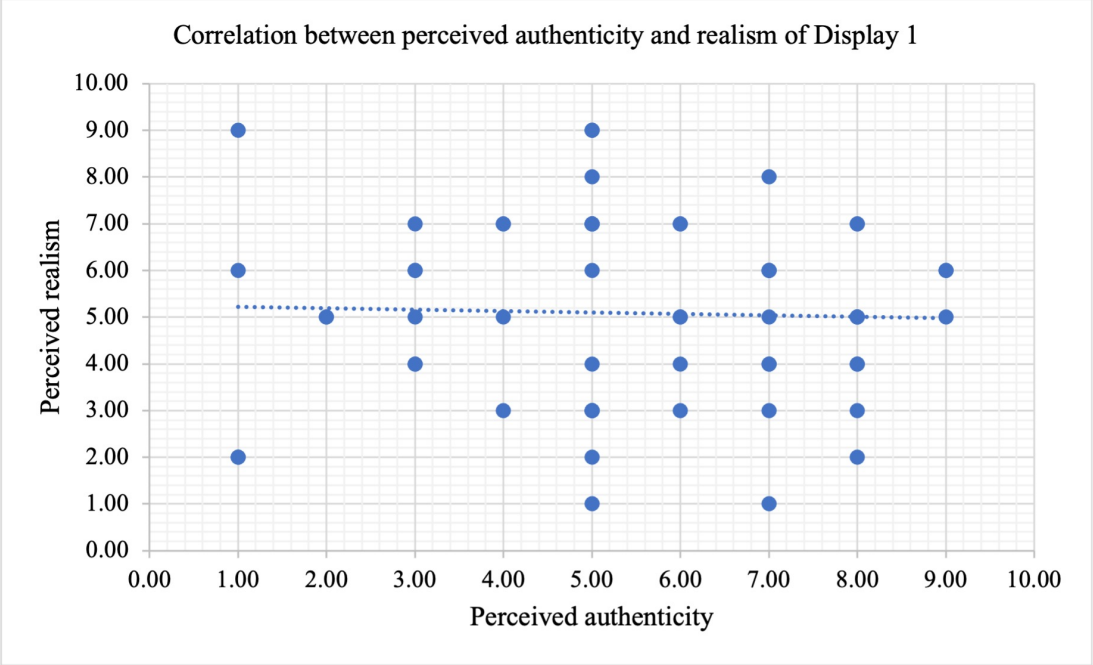


Figure 6.3: Correlation between perceived authenticity and realism of Display 1

6.4.1.2 Augmentation of reconstructed imageries

Discussions around the overall impact of each of the projection displays in Chapter 5 articulated that the image augmentation of tile designs (Display 2) was the most successful of the displays. Accordingly, the Likert scale results also demonstrate that augmentation of tiles visualisation directly on the relics was perceived as highly authentic with 68.33% (n=41) of visitors having rated it between scale points of 7 to 9; 16.7% (n=10) rated its authenticity highest on the scale. Survey results indicate that a critical factor in making display highly authentic and believable lies in the nature of the projection method. Direct image augmentation of the visualisation onto the remaining relics is dominant. Projections, in this case, are said to be perceived as authentic and real as reconstructed imageries were projected directly onto the fabric of the remaining relics. As visitors mentioned, direct image augmentation creates an effect that in the dark of night, one could not easily differentiate, which is real in physicality and which is the projected imagery of reality. The harmonisation of the projection display with the remaining relics not only led to the high perception of realism but also the perceived authenticity of the reconstructed imageries shown. The authenticity of the projections is not compared to the relics. It is negotiated on its own. However, the projection is perceived as authentic as a result of visitors being able to see similarities between the historically authentic and the augmented imageries.

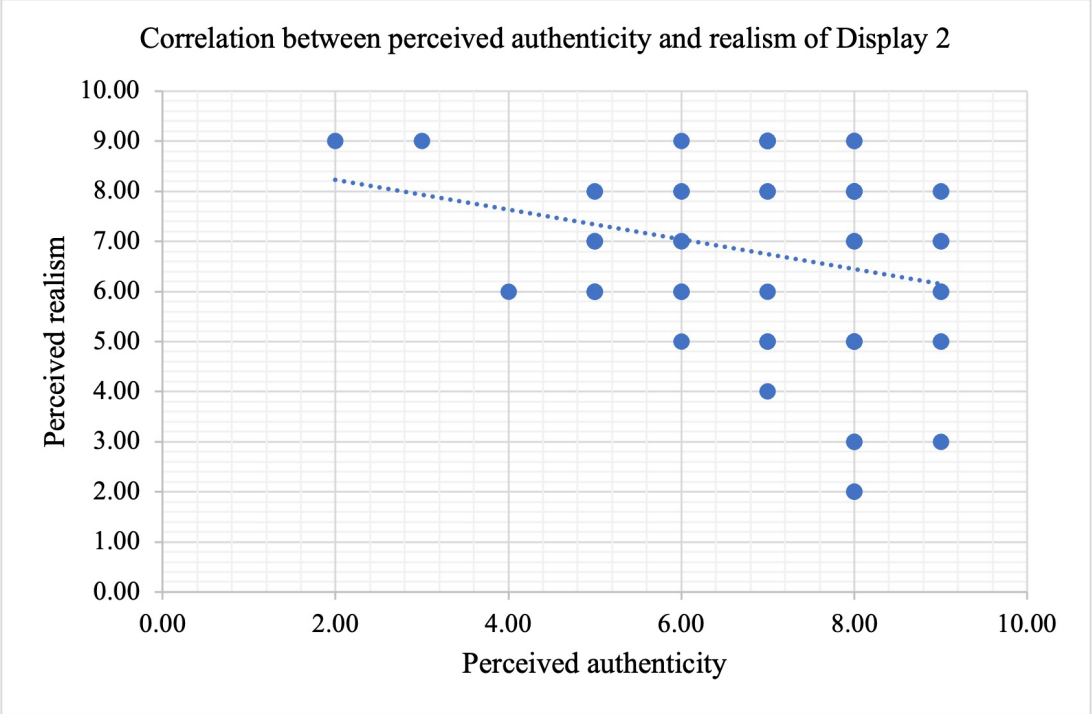


Figure 6.4: Correlation between perceived authenticity and realism of Display 2

6.4.1.3 Lenticular imageries

The lenticular image of Pièta, similar to the holographic display, was rated as moderately authentic and real. Slighter authenticity and realism perceived in this display can be correlated with its smaller integration with the site compared to the other two displays. The form of lenticular images is perhaps less natural for a historical context. It is more inclined towards an artistic representation of the imageries. As discussed in Section 6.2.1, perceived authenticity is interlinked with the extent to which the reconstruction blends into the site. Unlike the holographic and augmentation effects where authenticity is negotiated with consideration of the network of cues, including the site as a whole and the remaining relics, the lenticular image display, due to its very own nature, cannot be discussed in the same approach. The provocation of the reconstructed imagery and the display becomes the centre point in negotiating its authenticity and presumably influences visitors' perceived authenticity in a broader measure. Even though the display content can be examined as an authentic representation of medieval Pièta graffiti by some visitors, the lenticular form of the display impacts overall perceived authenticity in relation to the site. Such effect may also be

counted as an influential factor in the perceived authenticity of the holographic and augmented imageries displays, but as the integration of the lenticular imageries with the site is less, the impact is more noteworthy.

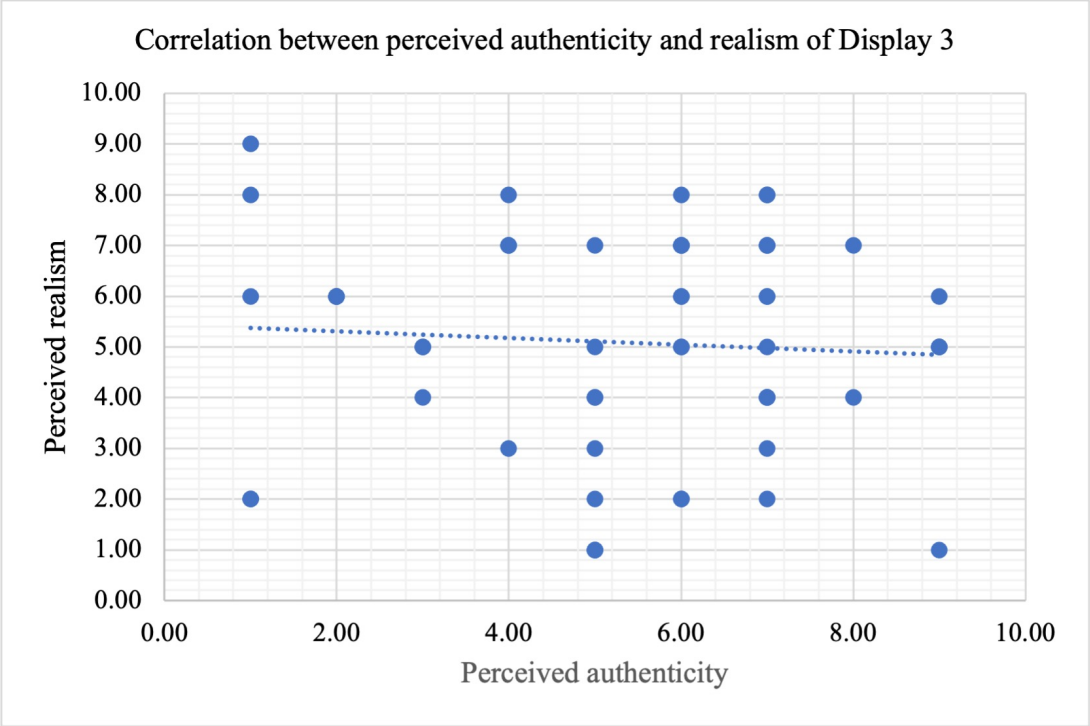


Figure 6.5: Correlation between perceived authenticity and realism of Display 3

6.4.2 Perceived realism of computer-generated imageries

This section explains the relationship between perceived realism or hyperrealism of reconstructed imageries with the quality of the imageries. It discusses how digital imageries that reach photo-realism are perceived as real or hyperreal reproductions of the real. It examines if the quality of the imageries has an impact on the perceived realism of the digital reconstructions. Photo-realism, according to Manovich (1996) and Kullmann (2014), is the procedure of reproducing an image that is indistinguishable from the photograph. From the theoretical point of view, photo-realism can be argued using Baudrillard's hyperrealism, in which the reality is reproduced. The reproductions, however hyperreal, simulate the real or the photograph.

An image, according to Baudrillard, can see four phases from being a "profound reality" to denaturing, masking and ultimately having no relation to any realities, but becoming

a pure simulacrum. Voase (2010), using Baudrillard's terminologies, states that history can be eroded through visualising; however, the visualisation can simulate reality in different levels.

Digital visualisations of heritage (even though theoretically perceived as hyper realities or regenerated realities simulating historically eroded events or artefacts) feature determining characteristics that, from a particular point of view, can question their realism. This section aims to illustrate identified particular specifications that impact perceived realism or non-realism of the reconstructed imageries of the Abbey artefacts. Jeffrey (2015) addresses a number of these characteristics in relation to digital visualisations, including lack of substance, territorial location, and physical degradation. In the case of St Augustine's Abbey, all three reconstructed imageries were erected in projected form. Hence, none had materialistic substances. Previously, Section 6.3.1 discussed that perceived realism in projections displays is not limited to tangible specifications. On the contrary, Jeffrey (2015) exemplifies lack of substance as an issue concerning digital visualisation of heritage. A general observation of the data indicates that visitors do not necessarily factor lack of substance a foremost concern in the digital visualisations of the non-existent artefacts. Reconstructed imageries in the form of light projections are indeed perceived as real to some degree.

Lack of degradation is another factor that Jeffrey (2015) refers to in relation to challenges in visualising challenges. The decay of physical artefacts is a focal point in studying them from an archaeological perspective. The concern raised around the digital visualisation of the artefacts, however, denotes the fact that traces of degradation cannot be found in digital replicas of heritage. This concept is close to visitors' concern about the age value of artefacts not being prominent in reconstructed imageries of the selected artefacts. It is also important to consider that even if the digital visualisation of heritage resembles the current state of the physical artefact with decay and deterioration, it requires progressive updating for representing the true image in the future.

The discussions presented in sections 6.4.1.1 to 6.4.1.3, as well as this section, inform that the perceived realism of re-constructed imageries depends on their relativity to

artefacts and the remaining relics. How re-constructed imageries could be justified in relation to Baudrillard's four orders of simulacra is arguable. The first order denotes a reflection of a profound reality. Its importance lies in being a faithful image of reality. The re-constructed imageries could be justified as the first order if one compares them to a point in history where the artefacts and the digital reconstruction are photo-realistically indistinguishable. As results demonstrate, perceived digital authenticity and realism correlate. Hence, it could also be argued that the re-constructed imageries, due to being perceived as authentic, are the first order. The second order of simulacra, masking a profound reality, could also be arguable if one considers the re-constructed imageries to be well enough integrated into the site to appear believable and become part of reality. However, simulacra's third and fourth orders could not be associated with the reconstructions as much. The third order, masking a profound reality, does not apply because the imageries were not displayed to mask the fact that artefacts have been demolished. On the contrary, they were created to support visitors with better envisioning the real. The fourth order, simulacra, is considered to have no relation with reality and yet again could not be associated with re-constructed imageries because the reconstruction has links with the artefacts representing different qualities. It becomes part of the biographical lineage of the artefacts that once were created, decayed and degraded, demolished and later on revived using technology.

6.4.3 Influence of image quality on perceived realism

The term 'visual realism' as articulated by Fan et al. (2018) is similar to the fidelity of computer graphics or the extent to which the computer-generated imageries are close to photo-realism. Ferwerda (2003) classifies visual realism into three additional categories, each addressing a particular correlation between the computer-generated image and the scene represented. The visual realism categories depict 'physical realism', 'photo-realism' and 'functional realism' of the imageries. Below perceived realism of the three projections displays is discussed in accordance with the visual realism Ferwerda's framework (2003).

Statistical analysis (Table 6.3) demonstrates that image quality is a prominent factor

Table 6.3: Statistical summary of image quality rating of projection displays

Image quality	N	Min	Max	Mean	Mode	Std. Deviation
Display 1	58	1	9	4.52	5	2.54
Display 2	60	1	9	7.43	9	1.63
Display 3	60	1	9	4.50	5	2.53

in perceiving realism in digital visualisations. Visitors' scale rating of the image quality of the three projection displays demonstrates that Display 2 (image augmentation of the tile designs) achieved the best ratings. On a scale of 1 to 9, the image quality of Display 1, based on N=58 out of 60 valid data entries, was rated on average as 4.52 with the scale rating 5=mode mostly repeated. The standard deviation value of 2.54 for Display 1, illustrates that the scale ratings commonly fall between 2 and 6, revealing that visitors considered the image quality for this display to be low or moderate.

Due to the fact that not many relics remain on site, visitors could not compare the image quality of the projections to references on the site. In particular, the image quality of Display 1 was rated with limited referential available to the visitors to make a comparison between the reconstructed imagery and the relics. Additionally, in the altered physical context of the Abbey at Stage 2 experiments where the projections were revealed, only remaining relics that the projections' light could reach could be seen. The alignment of the Projection Display 1, visualising the Norman column in the Nave area, merely illuminated parts of the North wall of the Nave. Hence, visitors' moderate justification of the image quality is not predominantly a consequence of comparison between the relics and the reconstructed imagery.

The luminance power of the projector used in this display plays a role in the image quality. However, attributes such as overall scale and visualisation of the layout of the stonework reflect the physical realism of the reconstructed imageries when compared to the relics. The accuracy of the physical properties of the Norman column in the reconstructed image is a result of photogrammetry and 3D scale modelling that has been described in detail in Chapter 3. Accordingly, the Pearson correlation of the values for image quality and perceived realism (0.631), however, indicate that although image quality and realism are related, the correlation, in this case, is not as strong as the correlation between perceived authenticity and realism.

Table 6.4: Pearson Correlation of perceived realism and image quality of Display 1

		Display 1 Realism	**Display 1 Image quality**
Display 1 Realism	Pearson Correlation	1	.631**
	Sig. (2-tailed)		0
	N	59	58
Display 1 Image quality	Pearson Correlation	.631**	1
	Sig. (2-tailed)	0	
	N	58	58
**** correlation is significant at the 0.01 level (2-tailed).**			

In the case of the second display based on N=60 valid data entries, image quality is rated as 7.43 on average. This figure indicates that overall, visitors found the image quality of the display high. Additionally, the standard deviation value of 1.63 indicates that the majority of scale ratings for the image quality of Display 2 falls between 7 and 9 the rating 9=Mode being highly repeated amongst all the scale ratings. Unlike Display 1, judging image quality in the second display and validating it in relation to visual references on site has been easier for visitors. This is due to the fact that the alignment of the second projection display not only revealed reconstructed imageries of the relics but also completed the tile patterns remaining on site. Therefore, evaluation of the image quality was highly influenced by comparing the quality of the reconstructed image with the fabric of the remaining relics. High rating of the image qualities indicates that the reconstructed imageries demonstrate visual characteristics similar to the remaining relics.

The reconstructed imagery of this display depicts the 'photo-realism' that, as described by Ferwerda (2003), presents an undistinguishable image from the scene. The process for achieving high quality and high visual resemblance in erecting reconstructed imageries of these displays has been explained in Chapter 3. As a result, as correspondingly presented in the statistical data, the correlation between image quality and perceived realism is also higher comparing to Display 1. The Pearson correlation between image quality and perceived realism for Display 2 (0.690), however greater in comparison in this display, does not indicate a high relevance between the two factors.

Table 6.5: Pearson Correlation of perceived realism and image quality of Display 2

		Display 2 Realism	**Display 2 Image quality**
Display 2 Realism	Pearson Correlation	1	.690**
	Sig. (2-tailed)		0
	N	60	60
Display 2 Image quality	Pearson Correlation	.690**	1
	Sig. (2-tailed)	0	
	N	60	60
**** correlation is significant at the 0.01 level (2-tailed).**			

In the case of Projection Display 3, visitors' assessment of the image quality is more similar to the results of Display 1. The average image quality rating for this display based on N=60 valid data entries is 4.5. The standard deviation value of 2.53 accordingly demonstrates that, alike Display 1, the image quality of this display was mainly rated between 2 and 6, which in a more general classification falls in low and moderate categories. The Pearson correlation value between image quality and perceived realism of this realism is higher, which indicates visitors rated image quality and realism of this projection more similarly compared to the two previous displays. The reconstructed imagery and its presentation as a projection installation requires attention when evaluating the results of the image quality. In the case of Displays 1 and 2, the imageries presented could be easily identified by visitors. However, Display 3 demonstrated a lenticular image of the medieval graffiti depicting the Pièta scene.

Consequently, low ratings for the image quality of displays can be explained twofold. Firstly, the two lenticular images depicted very similar visualisations. The only difference between the two images was that one included lines of the Pièta graffiti. Difficulty in differentiating the two can be one reason in justifying why visitors found this display not as good as the second display. Secondly, the presentation of lenticular imageries and its requisite to move around to see the two distinct images could be another reason as to why this display was not successful. Moreover, with respect to comparing the quality of the reconstructed image with the relics, visitors did not have the opportunity to make comparisons as the remains of graffiti engraving were not visible in the dark

and indeed were distanced from where the projection was displayed.

Table 6.6: Pearson Correlation of perceived realism and image quality of Display 3

		Display 3 Realism	**Display 3 Image quality**
Display 3 Realism	Pearson Correlation	1	.744**
	Sig. (2-tailed)		0
	N	59	59
Display 3 Image quality	Pearson Correlation	.744**	1
	Sig. (2-tailed)	0	
	N	59	60

The statistical analysis for Displays 1, 2 and 3 also demonstrates all three projections only caused a very low visual fatigue. As shown in Figure 6.6, the Mode figure for visual fatigue of all displays was Mode=1. Additionally, no correlation was determined between perceived realism and visual fatigue.

6.5 Conclusion

The analysis of perceived authenticity and realism suggests that visitors engage with the two subjects while visiting cultural heritage sites. Authenticity is observed in both materialistic and constructivist approaches. Visitors who negotiate authenticity in materialist approaches are concerned with the inauthenticity of reconstructions in light of a belief that the original or allegedly authentic in this context is irreplicable. Authenticity in this approach is frozen in materials erected in the past. Additionally, any attempt of reconstructing heritage fashioned in the past disregards the historical and the age values of the monument and would only falsify it. Therefore, from this point of view, reconstruction of the cultural heritage artefacts cannot be perceived as authentic. Visitors who observe authenticity in the constructivist approach find the reconstruction of non-existent cultural heritage artefacts as authentic as a result of truthful reconstruction and appropriately representing the historical artefacts. Unlike the materialist approach, visitors with constructivist thought line perceive reconstruction as authentic in the absence of the original.

Moreover, experiencing authenticity is not limited to finding an object to be authentic. In the constructivist approach, visitors perceive authenticity through experiencing the site as a whole and considering a network of matters that concern the remaining relics the reconstructions on display and the integration of the two. Perceived authenticity relies on how well the reconstructions are integrated into the site. The more the reconstructions blend into the context of the site, and the greater they are believable in relation to the other relics on the site, the higher the probability they are perceived as authentic. Projections are perceived as real when observed based on the physical context they create or their influence on how the physical environment is perceived. However, imageries are not considered to be real, rather hyperrealities representing or simulating reality.

Based on data gathered at Stages 1 and 2, despite authenticity and realism being broadly discussed in relation to the reconstruction of heritage artefacts from two unique perspectives, the two concepts are closely discussed by visitors whilst observing individual reconstruction on site. Analysis of perceived authenticity and realism demonstrates that visitors perceive the two notions correspondingly. The augmentation of reconstructed imageries onto relics in-situ is highly perceived as authentic and real as a result of good integrating into the site, clear demonstration of the tiles' designs and harmonisation between reconstructed imageries and the remaining relics. Image quality also impacts the perceived realism of the reconstructed imageries. However, the influence is not as prominent as perceived authenticity and varies from one display to another.

Chapter 7: Conclusions

7.1 Addressing research questions

This thesis focuses on four research questions:

1. How do visitors perceive different experience modalities?
2. How do different interpretation methods enrich visitor experiences?
3. How do digital reconstruction and in-situ presentation of non-existent artefacts influence visitor experiences?
4. In the case of digital reconstructions, what is the border between reality and hyperreality? Where and when one ends, and the other begins?

This thesis presented discussions around visitor experiences at heritage sites, particularly visitors' understanding of archaeological ruins in a fragmentary state. It focused on how different interpretation methods contribute to a more thorough understanding of heritage places where artefacts are either demolished or displaced. It examined heritage experiences sites-specifically at St Augustine's Abbey, an English Heritage property and part of the 'Canterbury Cathedral, St Augustine's Abbey, and St Martin's Church' World Heritage Site. This thesis examined the perceived value, advantages, and disadvantages of audio, visual, and guided interpretation methods offered on site (Stage 1) and introduced as part of this research (Stage 2).

As discussed in Chapter 2, heritage sites and other cultural institutions are increasingly

expanding interpretation methods by adopting digital technologies. Digitalisation and digital visual methods are particularly involved in interpreting the past. However, implementing and incorporating digital technologies at heritage sites does not only concern design, functionality, and fidelity. It also encourages rethinking appropriate and meaningful integration for heritage and archaeology interrelated contexts. This thesis argued that appropriate and effective implementation of digital technologies should acknowledge a variety of aspects that individually and collectively impact on heritage experiences from visitors' point of view. This is further emphasised in relation to demolished heritage sites and archaeological ruins where digital technologies could positively support visitors' negotiation of the place and perception of the physical settings of the site they visit. This thesis' contribution sits in evaluating multiple contributors to heritage experiences at St Augustine's Abbey (see Chapter 1) to gain a more profound understanding of visitor experiences. This thesis discussed visitor experiences beyond discussions on conventional heritage experiences, design and implementation of immersive technologies including AR and VR, and issues around authenticity and conservation of the integrity of heritage sites. It employs an interdisciplinary approach to examine heritage experiences offered by English Heritage (at St Augustine's Abbey) and prototyped as part of this research (Stage 2 experience modality) from multiple perspectives. It questioned how the integration of digital technologies in heritage settings could influence visitors' experiences, contribute to interpreting non-existent artefacts in the context of place, and how it could be perceived in relation to other domains within heritage studies.

This research has gathered site-specific information about a variety of interpretation methods at St Augustine's Abbey and their contribution to visitors' understanding of the site and lost tangible qualities of St Augustine's Abbey as an archaeological ruin. It has generated two data sets on visitors' perspectives of different aspects of heritage experiences. The analysis of four themes at Stages 1 and 2 present an understanding of heritage experiences from visitors' perspectives. The four themes are: 1) demographic profiles of visitors to St Augustine's Abbey; 2) visitor expectations and experiences; 3) the use of technology in heritage; and 4) views on authenticity and realism. The analysis presents thematic subjects related to heritage experiences from which some are

particular to Stage 1 experiences, some are relevant to Stage 2, and some others emerged from collective analysis of experiences throughout this thesis. It drew on information provided on interpretation methods and how interpreting information differently could influence experiences.

This thesis has demonstrated that visitors perceive experiences as a result of a network of matters which contribute to their experience on the site and support them in gaining more a comprehensive understanding of the site. The network of matters concerns visitors' experiences in relation to the physical attributes of the site and the settings in which the experiences shape. It also resonates with the interpretation of cultural heritage practices and history, which reflect the significance and prominence of the site. As the analysis in Chapter 4 demonstrated, interest in visiting a heritage site and expectations vary in different demographic groups, as does their interest in taking part in different interpretation schemes during heritage visits. However, from the findings, it is clear that, in general, visitors seek active engagement in heritage experiences. They favour being offered a chance to participate in the processes that shape their experiences and support them with making sense of the place as opposed to being passive audiences.

The analysis in Chapters 4 and 5 demonstrated that situatedness and embodiment in heritage settings play a key role in how visitors perceive their experiences and negotiate heritage interpretations. For visitors, being present in heritage settings is an opportunity to personally make sense of the physical space, navigate it and negotiate it in relation to other physical qualities of the place. Active exploration and walking around the site have been shown to engage visitors in a multisensory experience leading to situatedness and embodiment in heritage settings. Audio, visual, and guided interpretations of heritage also contribute to a better sense of place for visitors by contextualising the site with relevant historical and geographical information. Interactive engagement with audio and visual interpretations provides opportunities to relive the past, participate and be part of shaping the experience. Access to digital interpretations within the heritage settings, depending on the scale and extend, could support better understanding, or alternate how visitors envision the site while they experience the ruins.

The analysis in Chapters 4, 5 and 6 revealed that different interpretation methods individually contribute to a more comprehensive understanding of the site. This thesis has demonstrated that interpretation methods, while providing information through different channels, invite and support visitors to make sense of the site in a wider context. For example, the audio guide devices provide auditory narration about historical events at the Abbey and personas but also support visitors with ways of finding and navigating the site. The guided tours interpret events and historical facts about different parts of the site. However, arguably, guided tours at St Augustine's Abbey could facilitate dialogue between the tour guide and the audience. Visitors consider a broader context of guided tour experiences. They not only reflect on guided tour experiences as a chance to receive information but also an opportunity to contribute to the experience by participating in dialogue and communicating. The object displays present artefacts and interpret the use, make and the historical era of objects. This thesis has revealed that visitors prefer a closer interaction with historical artefacts, which, following discussions on experience domains in Chapter 2, further emphasises the experiences and interactions with cultural heritage within. The findings at St Augustine's Abbey suggest that the object-centric displays could go beyond and elaborate on experiences, allowing connectivity and interaction with the artefacts. This is particularly arguable about sites where artefacts are demolished or displaced and could not be experienced in their original context, place and in correlation with other relics. However, this is debatable in heritage conservation in terms of how heritage sites could further engage visitors with artefacts while conserving and preserving artefacts.

Analysis presented in this thesis has revealed that visual interpretation methods such as VR and SAR projections not only visually interpret lost qualities of the Abbey but also support visitors with making sense of space and heritage settings as they explore the archaeological ruins. Therefore, depending on the method, visual interpretation methods help visitors to envision how the archaeological ruins may have looked like as they walk around the site. Although, VR and SAR approaches in visualising the Abbey differently contribute to making sense of the Abbey as a place before destruction. They have different implications on how visitors perceive the visualisations and correlate them with the heritage place. Visual interpretations present the context of place differently,

and thus their impact on making sense of place differs too. The VR presents a 3D visual demonstration of the Abbey. In that sense, it supports envisioning the monastic complex in the 16th century.

However, other factors intertwined with digital visual interpretations of heritage could influence their perceived value and impact heritage experiences. The results in Chapter 5 demonstrated that in the case of VR experiences, interaction quality (this is arguable about St Augustine's Abbey) affects immersion and, ultimately, perceived usefulness of the experience. The interaction quality directly impacts how the user moves in between virtual environments spaces. Its lack of harmony with walking and navigating spaces in reality affects the experience. The SAR projections present artefacts and visual qualities but because of their in-situ integration they also contribute towards understanding how the Abbey site may have looked like. As the analysis of in-situ projections at Stage 2 demonstrated, visual interpretations as such could be counted as references in heritage sites to envision the bigger picture.

The analysis in this thesis revealed that, in-situ projections of reconstructed artefacts, beyond visual interpretation, affect heritage experiences by modifying the physical context of place. However, intervention in physical settings raises questions about integrating the digital and the historical. The concerns initiate from contradictory arguments around perceived authenticity in heritage. This research identified that visitors' negotiation of authenticity in heritage correlates with their experiences in the physical settings of the Abbey site and the remaining relics. Further to the theoretical viewpoints of the materialist and constructivist approaches towards authenticity, this thesis revealed that heritage settings and what sits within it can influence visitors' negotiation of authenticity. On the one hand, digital reconstructions and in-situ projection of artefacts could be positioned to create novel experiences of the site leading to perceived authenticity that is linked to genuineness in heritage experiences. In this context, genuineness refers to experiences that are authentic in their own way and not similar to conventional experiences offered on site on daily bases. On the other hand, digital interventions could lead to perceived inauthenticity within heritage settings due to two primary reasons. Firstly, originating from a materialist approach towards authenticity, demolished or displaced artefacts of the site are authentic. The reconstruction of which, whether material or

digital, is not authentic and could also influence the perceived authenticity of the site as a whole. Secondly, digital imageries in projections of non-existent artefacts could be a misinterpretation of the age value of the artefacts and raise concerns about how the authenticity of the site could be threatened with inappropriate digital interventions.

Beyond discourses around authenticity, this research also questioned the perceived realism of projections of non-existent artefacts in heritage settings. Discussions in Chapter 6 examined the qualities visitors associate to 'real', representation of the real and the 'hyperreal' in relation to historical artefacts and their digital reconstructions. It concluded that where digital reconstructions of artefacts blend in more within the site, they are perceived as more authentic and real. Thus, the authenticity of digital reconstruction and realism have a direct relationship and accordingly impact visitors' experiences on site.

7.2 Contribution to knowledge

This thesis contributes to an area of heritage studies, particularly examining heritage experiences at St Augustine's Abbey managed by English Heritage. It contributes to an already explored but understudied field that discusses heritage experiences in correlation with other notions, namely digital reconstruction and in-situ presentation of lost artefacts as well as their implications on authenticity and integrity of the site. The research aimed to conduct a loop of observations, analysis and experience prototyping, with the intention of identifying opportunities to enhance visitors' experiences, including how in-situ projections of digitally reconstructed non-existent artefacts could support visitors with making sense of place as they visit the site.

Further to discussions on heritage interpretation methods in the UK and worldwide (Chapter 2), this research focused on St Augustine's Abbey to examine heritage experiences offered by English Heritage and to compare the efficiency of a variety of interpretation methods from the visitors' point of view. The case studies examined throughout this thesis support better understanding of interpretation and visitor experiences at heritage sites. In the past decades, visual interpretation methods have been

increasingly employed to present qualities that are no longer within reach and available to visitors in the context of place. Further to analysing the influence of visual interpretation methods on heritage experiences, this research focused on their contribution towards better understanding the physical settings and making sense of the heritage place.

The discussions presented in this thesis are centralised around the context of place and explore heritage-affiliated subjects in relation to place, including phygital solutions to visual interpret non-existent artefacts in the context of place at heritage at the Abbey. The phygital approach in this research itself is intertwined with heritage discourses from several points of view. Phygital, as introduced in Chapter 2 and discussed later in the thesis, is coined around the integration of digital in physical environments. The theoretical approaches to phygital discussed in this include in-situ visual interpretation, the World-as-Support paradigm through projections, as well as theoretical viewpoints on the consequences of intervention in heritage settings. Phygital, achieved through in-situ-visualisation, is referenced by introducing a method to revive artefacts in the context of place digitally. Concerning the WaS paradigm, the phygital supports visitors in making sense of place by providing a visual interpretation that supports a better understanding of the remaining relics on site and envisioning the historical Abbey. From a theoretical points of view, this thesis discusses phygital concerning intervention. It discusses how integrating digital with the material fabric of the site could be perceived as a threat to the authenticity or integrity of the site. Furthermore, this thesis also discusses how digital approaches to interpreting non-existent artefacts could be perceived as authentic or real when observed in relation to physical settings.

Additionally, this research contributed to the field of digital heritage, in particular to the research which focuses on technical frameworks, and the development and implementation of immersive technologies including VR and AR. It addressed a commonly raised issue in digital applications of cultural heritage where handheld or wearable devices have been identified as barriers between the user and the site, and to decrease users' awareness of the space and cause distraction from the site. The method introduced in this research, in-situ projection of non-existent artefacts, rethinks the possibilities of bringing technologies to heritage sites by blending digital technologies with the fabric

of heritage sites. It also contributed to the use of projection methods for in-situ visualisation of heritage beyond aesthetic qualities of projection mappings on heritage facades and also the SAR impact of making sense of place.

7.3 Wider implications of research

This research has also identified a number of matters that, if reflected on, could enhance visitor experiences, and broaden interpretation at St Augustine's Abbey. Based on the research findings, as reported by visitors at Stages 1 and 2 of the study, further emphasis on the life and daily practices at the Abbey could be incorporated into interpretation methods to support visitors in understanding the site. For example, analysis in Chapters 4 and 5 demonstrated that often visitors seek active interpretation of the monastic life. However, as discussed in Chapter 4, enactment could raise concerns about authenticity. As such, involving performative interpretation of the life and practice at the monastic Abbey requires further considerations to diminish staged authenticity.

Furthermore, reflections on Stage 2 experiences demonstrated that a noticeable number of visitors to the Abbey were satisfied with experience modality, setting and arrangements in the dark. Therefore, at St Augustine's Abbey, more could be done to further develop and widen the experience modalities offered on site. The analysis of Stage 1 and 2 experiences in this research revealed that the Abbey receives visitor groups with diverse expectations and interests. Thus, developing alternative experience modalities could encourage visitations from wider demographics and expand visitation opportunities.

This research has presented analysis of the (dis)advantages of a variety of interpretation methods and how these are perceived by visitors. Further to the analysis of perceived value of individual interpretation methods from visitors' perspectives, this thesis provides examples of different interpretation modalities and deliveries in Chapter 2 and throughout the analysis in Chapters 4, 5 and 6. This analysis is site-specific to St Augustine's Abbey. However, it could be employed to gain a better understanding of

interpretation methods and visitor experiences at heritage sites with similar characteristics - including heritage sites that are repurposed and are no longer managed or used in their original context. The analysis could support cultural institutions, heritage sites in particular, and other properties managed by English Heritage to develop a wider range of effective interpretation and make tangible links for visitors at archaeological ruins where artefacts are demolished and displaced; hence, the sites as a whole do not comprehensively put on display their grandeur, objects and materials.

Beyond the data analysis, the research framework and practical solutions employed in this thesis could be adopted to conduct an interdisciplinary evaluation at heritage sites and cultural institutions elsewhere. From a research perspective, this thesis' approach in evaluating heritage experiences and interpretation methods, a combination of theoretical, user experiences and heritage discourses can be employed in other heritage sites to better understand the experiences offered. The interdisciplinary approach of examining digital solutions for their implication on transmitting cultural presence and usability can be employed to design digitally enhanced experiences for appreciation of demolished or displaced artefacts and sites in a broader context of place. Additionally, from methodological and practical points of view, the SAR solution could be adopted for heritage artefacts and sites with fragmented conditions. This research has introduced and tested three variations of visually reviving artefacts in the context of place, which can be adapted to other sites considering the degrees of decay and demolishment to visually interpret a more comprehensive image of the historical states of heritage sites. For example, the holographic effect projection designed for the nave at St Augustine's Abbey could be created in multiplication to recreate several elements or structures at a heritage site for an enhanced sense of place.

7.4 Limitations

Experience focus: The guided tours organised as part of Stage 1 only focused on the 'The Decline and Fall of St Augustine's Abbey' and were delivered by one tour guide. Including guided tours on other historical contexts of the Abbey could have expanded the understanding on how different historical eras of the Abbey could be interpreted for

visitors. Additionally, organising experiences delivered by more than one guide could have expanded the evaluation of the delivery of tours and further understanding of how tour guides can engage visitors differently and communicate with their audiences while providing interpretation.

Weather conditions: As the Abbey site is open-air, weather conditions impacted visitor experiences. At both Stages 1 and 2, visitors occasionally reported that windy, rainy, or cold weather conditions influenced their experiences. It has been noticed that the weather had two negative consequences on visitor experiences. Firstly, occasionally visitors reported that weather conditions decreased the comfort of the visit. Stage 2 experiences were conducted in November and December, where visitors were required to be outdoors for the duration of their visit. Organising Stage 2 experiences during other weather conditions and particularly in warmer and dryer months could have minimised the weather impact on visitor experiences. Secondly, -this is arguable only for Stage 2 experiences - the wind affected the projection displays by moving the projection fabric at Displays 1 and 3. This is why some visitors found the wind effect stimulating. However, others described it as disruptive for visualisation.

Experiences in the dark: Stage 2 experiences were exclusively organised after sunset. Darkness is a requirement for projections to output clear images in full capacity. Whilst darkness was a requirement for the projection of reconstructed imageries, it meant that visitors could not benefit from seeing other areas of the site apart from where the projections illuminated. As such, whilst this experience modality offered a new experience of the site, it also limited exploring the site to some extent. Further lightings and projections on site could elaborate on experiences by illuminating larger precincts on site for visitors, such as the light show on the site performed by Griffin in 2019 on the occasion of celebrating the 30th anniversary of World Heritage in Canterbury.

Survey design: Question about the age group of visitors at Stages 1 and 2 includes two options that participants aged 65 years old could choose. The repetition of 65 age option in 44-65 and 65+ classifications could impact the interpretation of data in relation to the two groups.

Demographic profile of visitors: The demographic profile participating could have been

more expansive. Further work on inviting visitors to participate in the research study, such as community engagement programmes could have expanded the diversity of data collected and elaborated the research findings.

7.5 Recommendations for future practice

The research findings at St Augustine's Abbey presented an interdisciplinary perspective towards understanding heritage experiences, including interpretation methods offered by English Heritage and experience design for visual interpretation of artefacts. The findings contribute towards developing a proposal outlined below for enhanced visiting experiences according to the emerging themes of situatedness and combined advantages of audio-visual interpretation methods (Basaraba et al., 2019). The proposed experiences is in line with the core idea behind Stage 2 experiences: supporting visitors' experience of the Abbey with digital augmentation of content on the environment. It is inspired by the World-as-Support paradigm (Malinverni et al., 2017) on embodiment in projected environments and using the surrounding environment to interact with digital technologies. The proposed experience of St Augustine's Abbey initiates from four key findings in this research. It intends to broaden visitation experiences on site and enhance visitor experiences by reflecting on the findings and building a framework beyond.

1. Guided experiences in heritage settings: Building on the importance of situatedness in heritage context and experience of archaeological ruins, as discussed above, the proposed experience modality leverages the importance of physical presence in the site by introducing a walking trail of the Abbey where visitors could explore the site on a predefined route and interact with the site using handheld projectors.

   The route not only supports visitors with semi-guided experience of the Abbey but also could act as a digital interpretation trail with multiple focal points. As such, the experience will guide visitors on site through a predefined route with several stops where visitors can project interpretive content on standing struc-

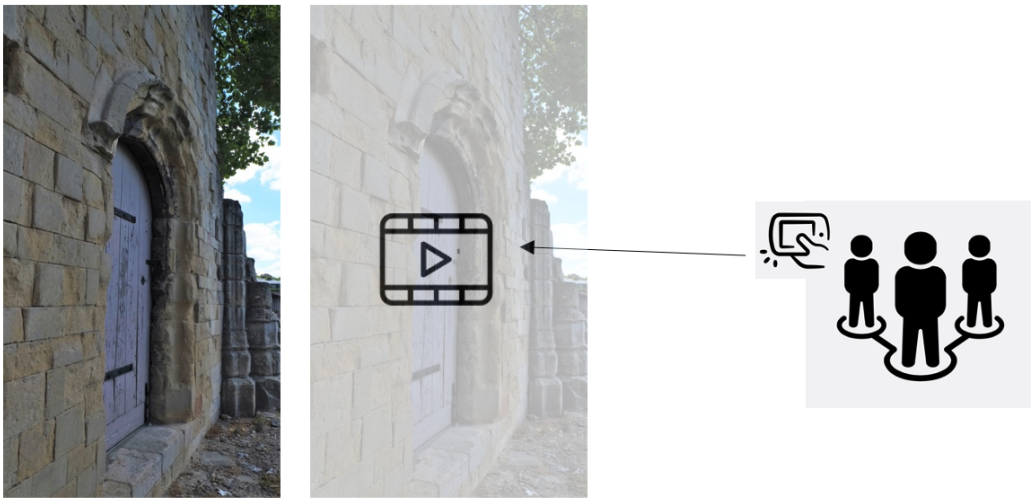


Figure 7.1: Demonstration of proposed experience at the Æthelberht tower

tures of the Abbey. Similar to the audio-guide experience, the walking trail would act as a navigation tool for visitors to experience a number of locations on site. The walking trail of the Abbey would include a number of locations for which specific digital media interpretation content would be prepared. It could also expand experiences on site by interpreting key locations and include locations that are not included or less emphasised in audio-visual interpretive content offered as part of the audio-guide, VR and SAR projections. Therefore, it would facilitate embodiment in heritage settings supported by a route experience and interpretive content on demand. It could also further expand outside St Augustine's Abbey and in relation to the broader urban area including and guiding to other prominent destinations in Canterbury, namely Canterbury Cathedral and St Martin's Church (WHS), the King's school.

2. Unconventional experience of the heritage sites: The analysis of visitor expectations and experience at Stage 2 demonstrated that a noticeable number of visitors appreciated visiting the site in an altered physical setting. The proposal leverages this finding by introducing an experience which opens the site for alternative visits unlike conventional everyday experiences. St Augustine's Abbey is open to visitors from April to October all week and weekends from November to March. Similar to many other English Heritage properties, heritage experiences at St

Augustine's Abbey are chiefly offered during the daytime. Whilst many English Heritage properties operate during the day, nominated sites are also open to visitors at night for special occasions, including the annual 'Enchanted Events'. Findings at Stages 1 and 2 of this research reveal that visitors to St Augustine's Abbey have different interests and expectations from visiting the site and that a significant number of visitors (73.34%(n=44)) found the experience of the Abbey at night satisfactory. Therefore, the walking trail at the Abbey at night could expand visitation opportunities and interest a wider social demographic to visit the site under different circumstances. Further to the discussion on authentic experiences in Chapter 6, the experience modality is an opportunity to develop novel and authentic experiences of the site.

3. Visitor engagement and interaction: As observed in the analysis, particularly in Chapters 4 and 5, visitors seek active engagement in heritage site. The proposed experience modality suggests an interactive experience whereby visitors do not only receive interpretation but play a part in shaping the experience by using handheld projectors. The experience design (Figure 7.2) allows visitor to engage with the archaeological ruins by projecting digital media. The experience intends to facilitate an enhanced experience of the Abbey where visitors could choose to the see archaeological ruins with projections or unlock additional audio-visual interpretation of the trail locations on demand.

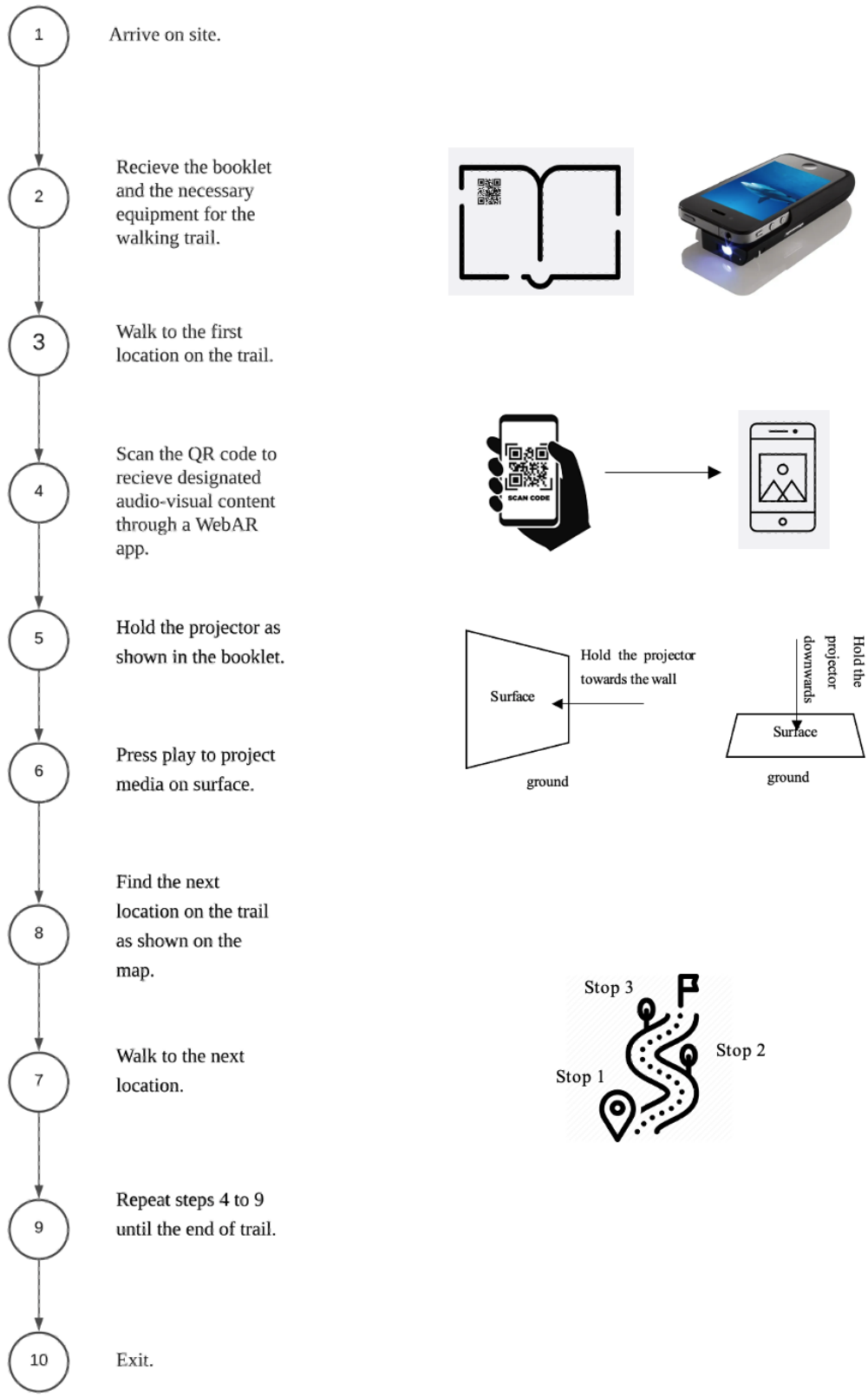


Figure 7.2: Visitor journey on site for the walking trail experience with handheld projectors

4. Interpretation: Analysis of interpretation methods, specifically in Chapter 5, demonstrated that while each audio narration and visual interpretation method contributed to a better understanding of the site, they could also supplement each other to enhance visitor experiences further. Therefore, the proposed experience modality suggests using a combined digital audio-visual method for interpretive storytelling on the walking trail of the Abbey. The research findings demonstrated that visitors seek further interpretation of the life and daily practices at the Abbey. As formerly mentioned, enactment could raise concerns about staged authenticity and, thus, is not the best solution to interpret events at the historical monastic complex. However, digital media could be employed to introduce novel interpretation methods. The experience modality could include narratives about historical characters, events, and objects in relation to the particular location on the trail.

Table 7.1: Proposed interpretive content for trail locations

Stop	**Nominated stops on the trail include**	**Content for interpretive media**
1	The Æthelberht tower	Story of the rise, development and suppression of the Abbey introducing the role of St Augustine, King Æthelberht, and Queen Bertha reintroducing Christianity to England and building the Abbey.
2	The royal palace	The conversion of the monastery into a royal palace in preparation for the arrival of Anne of Cleves by the order of Henry VIII.
3	Wulfric Rotunda	Vision for a spatially integrated church which was never completed; An octagon structure that could connect create a more honorific setting for the toms of archbishops and kings.
4	The chapel of our Lady the Angels	Dynamic video of the wall paintings
5	The cloister	Work of Abbot Scolland: The Bayeux Tapestry

Consequently, this research on heritage experiences at St Augustine's Abbey contributes to a better understanding of the different interpretation methods on site, as well as how new solutions such as projection displays could enhance visitors' understanding

of the non-existent artefacts and the historical Abbey. This research evaluated the impact of in-situ visual interpretation of artefacts on visitors making sense of place. Based on the analysis of heritage experiences at the Abbey, and the key findings, this research proposes the utilisation of interpretation methods that leverage the advantages of different audio-visual technologies, presence and embodiment on site.

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Appendices

A Stage 1 Participant Information Sheet

'Evaluation of visitor experience at St Augustine's Abbey before and after projecting reconstructed imageries of non-existent artefacts of the abbey on site.'

Thanks for your interest in this research project. Please read this information carefully before signing the consent form. The data you provide will be anonymised.

1. What is the research project about?

This study is part of the project 'Evaluation of visitor experience at St Augustine's Abbey before and after projecting reconstructed imageries of non-existent artefacts of the abbey on site' and will be conducted and funded by Ayda Majd Ardekani, a PhD researcher at the School of Engineering and Digital Arts (University of Kent) under the supervision of Dr Rocio von Jungenfeld (R.von-Jungenfeld@kent.ac.uk) and Dr Sophia Labadi (S.Labadi@kent.ac.uk). The study involves two data collection sessions.

2. Why are you invited to take part and how will you be involved?

You are invited to participate in two data collection sessions, one before and one after projecting the reconstructed imageries of the abbey onsite, either as a public visitor or an English Heritage member aged 18+. Your participation is voluntary, and you may opt out at any time. If you decide to opt out, your data will be destroyed and no longer included in the analysis providing that it has not yet been examined or partially published.

During both data collection sessions, you will be asked to complete a survey. The survey includes open questions regarding your visitor experience of the abbey. Filling out the questionnaire should take about 15 minutes. You are now at study session 1 and will be invited to the study session 2 later in 2019. You will be contacted by the details you provide on the contact information sheet today. You will be provided a separate consent form at each data collection session.

3. What happens to the data collected?

Responses will be analysed to evaluate your visitor experience and how your overall perception and understanding of the abbey may have been influenced by the projections displayed at the second session. The data collected during both study sessions will be kept on University of Kent's password protected server for 3 years or until the data analysis has been completed, whichever is greater. Thereafter, the anonymised data will be kept on a personal hard drive only accessible to the researcher. Results of the studies will be published in academic papers and in the PhD thesis of Ayda Majd Ardekani. After completion of the PhD thesis, the information you provide on the questionnaires might be anonymously made available via open access repositories.

4. Are there any risks involved?

There are no significant risks. However, please be aware of uneven ground while walking in the site, and during the second session of any equipment installed as part of the experience. Also, as your personal information are kept confidentially, there are no risks of exposure apart from the researcher. However, if you enter the site as an English Heritage member, the institution will recognise your presence there.

5. What are the benefits of participating?

Your contribution to this research is much appreciated as it will help developing methods for evaluating the impact of digital projections on visitors' experiences at heritage sites. You will be granted free entry to the site on both study sessions if you are not already an English Heritage member. Admission tickets are funded by the researcher and will be provided to you upon your arrival. You will be then given instructions on the data collection session and required to submit your questionnaire before you leave the site.

6. Ethical clearance for the research project

The Research Advisory Group at The University of Kent and English Heritage have given ethical clearance to the project and approved to conduct the research studies.

7. How to get in touch?

If you require further information on the research project and study sessions or have any concerns, please do not hesitate to ask on the day of the data collection session or contact Ayda via details provided.

Ayda Majd Ardekani

1.46 Jennison Building, School of Engineering and Digital Arts, University of Kent CT2 7NT.

Email: am2324@kent.ac.uk

Tel: +44 (0)1227 764000 (School of Engineering and Digital Arts reception)

General Data Protection Regulation (GDPR) Privacy notice for research – University-level

As a university we use personally-identifiable information to conduct research, including to improve health, care and services. As a publicly-funded organisation, we have to ensure that it is in the public interest when we use personally-identifiable information from people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use your data in the ways needed to conduct and analyse the research study. Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally- identifiable information possible.

The University Charter sets out that 'the objects of the University are to advance education and disseminate knowledge by teaching, scholarship and research for the public benefit' (paragraph 3).

Health and care research should serve the public interest, which means that we have to demonstrate that our research serves the interests of society as a whole. We do this by following the UK Policy Framework for Health and Social Care Research.

If you wish to raise a complaint on how we have handled your personal data, you can contact our Data Protection Officer who will investigate the matter. If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful you can complain to the Information Commissioner's Office (ICO).

The University of Kent's Data Protection Officer can be contacted at:

https://www.kent.ac.uk/infocompliance/dp/staff-info/staff-info.html

B Stage 1 Consent form

CONSENT FORM

To be adapted as appropriate to the specific research project

Title of project: Evaluation of visitor experience at St Augustine's Abbey before and after projecting reconstructed imageries of non-existent artefacts of the abbey on site.

Name of investigator: Ayda Majd Ardekani

Participant Identification Number for this project:

Please initial box

1. I confirm I have read and understand the information sheet dated… (version…) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason. *(Insert contact number here of lead researcher/member of research team, as appropriate, please avoid using personal phone number).* ☐

3. I understand that my responses will be anonymised before analysis. I give permission for members of the research team to have access to my anonymised responses. *(Also add here a statement about publication of anonymised direct quotes, if this will be done).* ☐

4. I agree to take part in the above research project. ☐

Name of participant	Date	Signature
Name of person taking consent *(if different from lead researcher)*	Date	Signature

To be signed and dated in presence of the participant

Lead researcher	Date	Signature

Copies when completed: 1 for participant; 1 for researcher site file; 1 (original) to be kept in main file

C Stage 1 Questionnaire

Part one: Please provide some information about yourself.

1. What is your gender identity?
   ☐Female ☐Other/Non-binary
   ☐Male ☐Prefer not to say

2. Please indicate your age group.
   ☐18-24 ☐45-65
   ☐25-34 ☐65+
   ☐35-44 ☐Prefer not to say

3. Please indicate the town/city of your current residence.

4. How often do you visit a heritage site?
   ☐Once a month ☐Every 3-6 months
   ☐Every 2-3 months ☐Every 6-12 months

5. Are you currently a member of English Heritage?
   ☐Yes
   ☐No
   ☐Not sure

Part 2: Visitor's expectation and experience

6. How many times have you visited St Augustine's Abbey? If this is not your first visit what made you to come back?

7. Did you look up the site prior to your visit today?
   ☐Yes
   ☐No
   If yes, please describe how and why you looked up the site beforehand.

8. Please explain what you expected to encounter during your visit today.

9. Please compare your experience with your initial expectations of the site?

10. Does the current display provide sufficient information about the history of the site?

11. In your opinion, does the current display accurately convey the history of the site?

Part 3: Technology for Heritage /Visitor Engagement

12. Did you try the Virtual Reality headsets?
    ☐Yes
    ☐No
    Please rate how immersive do you think the Virtual Reality is on the scale of 1-9.

1- Not at all	2	3	4	5- Somewhat	6	7	8	9- Very much
○	○	○	○	○	○	○	○	○

How easy was it for you to look around the abbey in the virtual reality space using the headsets?

In your opinion, does the VR provide good quality information about the abbey?

13. Did you use the audio guide whilst exploring the site? If yes, did it provide you with useful information about the site?

14. Overall, please explain how the use of technology was beneficial for you today?

Please rate how beneficial the use of technology was for you today.

1- Not at all	2	3	4	5- Somewhat	6	7	8	9- Very much
○	○	○	○	○	○	○	○	○

15. To what extent does visual information influence your understanding or interpretation of the site? Please describe why.

16. Please explain the ways you observed the ruins today?

17. Would digital and creative installations in the ruins influence your engagement with the site? If so, would this influence be positive or negative?

Part 4: Views on authenticity and realism

18. Do you think digital reconstructed imageries can be authentic? Please explain.

19. Do you think projections are real? Please explain.

20. Would you like to see digital art interventions on heritage sites providing that they do not damage the site? If any, what type of interventions can you think of?

D Stage 2 Participant Information Sheet

'Evaluation of visitor experience at St Augustine's Abbey before and after projecting reconstructed imageries of non-existent artefacts of the abbey on site.'

Thanks for your interest in this research project. Please read this information carefully before signing the consent form. The data you provide will be anonymised.

1. What is the research project about?

This study is part of the project 'Evaluation of visitor experience at St Augustine's Abbey before and after projecting reconstructed imageries of non-existent artefacts of the abbey on site' and will be conducted and funded by Ayda Majd Ardekani, a PhD researcher at the School of Engineering and Digital Arts (University of Kent) under the supervision of Dr Rocio von Jungenfeld (R.von-Jungenfeld@kent.ac.uk) and Dr Sophia Labadi (S.Labadi@kent.ac.uk).

2. Why are you invited to take part and how will you be involved?

You are invited to participate in the data collection for 'projecting the reconstructed imageries of the abbey onsite', either as a public visitor or an English Heritage member aged 18+. Your participation is voluntary, and you may opt out at any time. If you decide to opt out, your data will be destroyed and no longer included in the analysis providing that it has not yet been examined or partially published.

During the sessions, you will be asked to complete a survey. The survey includes open questions regarding your visitor experience of the abbey. Filling out the questionnaire should take about 15 minutes. You will be provided with a consent form at the data collection session. This study session will be documented in image and video formats. Such material will only be used for the documentation not for data analysis. You may consent to/not to appear on the images and video footages.

3. What happens to the data collected?

Responses will be analysed to evaluate your visitor experience and how your overall perception and understanding of the abbey may have been influenced by the projections displayed at the second session. The data collected during the session will be kept on University of Kent's password protected server for 3 years or until the data analysis has been completed, whichever is greater. Thereafter, the anonymised data will be kept on a personal hard drive only accessible to the researcher. Face blur effects will be applied to images and video footages for de-identification. Results of the studies will be published in academic papers, presentations and online portals as well as in the PhD thesis of Ayda Majd Ardekani. After completion of the PhD thesis, the information you provide on the questionnaires might be anonymously made available via open access repositories.

4. Are there any risks involved?

There are no significant risks. However, please be aware of uneven ground while walking in the site, and during the second session of any equipment installed as part of the experience. Also, as your personal information are kept confidentially, there are no risks of exposure apart from the researcher. However, if you enter the site as an English Heritage member, the institution will recognise your presence there.

5. What are the benefits of participating?

Your contribution to this research is much appreciated as it will help developing methods for evaluating the impact of digital projections on visitors' experiences at heritage sites. You will be granted free entry to the site. You will be then given instructions on the data collection session and required to submit your questionnaire before you leave the site.

6. Ethical clearance for the research project

The Research Advisory Group at The University of Kent and English Heritage have given ethical clearance to the project and approved to conduct the research studies.

7. How to get in touch?

If you require further information on the research project and study sessions or have any concerns, please do not hesitate to ask on the day of the data collection session. Otherwise, please contact Ayda or Prof Steven Gao via the details provided:

Ayda Majd Ardekani

1.46 Jennison Building, School of Engineering and Digital Arts, University of Kent, Canterbury, CT2 7NT.

Email: am2324@kent.ac.uk

Tel: +44 (0)1227 764000 (School of Engineering and Digital Arts reception)

Prof Steven Gao

1.04 Jennison Building, School of Engineering and Digital Arts, University of Kent, Canterbury, CT2 7NT.

Email: s.gao@kent.ac.uk

Tel: +44 (0) 1227823716

General Data Protection Regulation (GDPR) Privacy notice for research – University-level

As a university we use personally-identifiable information to conduct research, including to improve health, care and services. As a publicly-funded organisation, we

have to ensure that it is in the public interest when we use personally-identifiable information from people who have agreed to take part in research. This means that when you agree to take part in a research study, we will use your data in the ways needed to conduct and analyse the research study. Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally- identifiable information possible.

The University Charter sets out that 'the objects of the University are to advance education and disseminate knowledge by teaching, scholarship and research for the public benefit' (paragraph 3).

Health and care research should serve the public interest, which means that we have to demonstrate that our research serves the interests of society as a whole. We do this by following the UK Policy Framework for Health and Social Care Research.

If you wish to raise a complaint on how we have handled your personal data, you can contact our Data Protection Officer who will investigate the matter. If you are not satisfied with our response or believe we are processing your personal data in a way that is not lawful you can complain to the Information Commissioner's Office (ICO).

The University of Kent's Data Protection Officer can be contacted at:

https://www.kent.ac.uk/infocompliance/dp/staff-info/staff-info.html

E Stage 2 Consent form

CONSENT FORM

To be adapted as appropriate to the specific research project

Title of project: Evaluation of visitor experience at St Augustine's Abbey before and after projecting reconstructed imageries of non-existent artefacts of the abbey on site.

Name of investigator: Ayda Majd Ardekani

Participant Identification Number for this project:

	Please initial box
1. I confirm I have read and understand the information sheet dated… (version…) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.	☐
3. I understand that my responses will be anonymised before analysis. I give permission for members of the research team to have access to my anonymised responses.	☐
4. I approve the publication of my anonymised direct quotes.	☐
5. I approve to appear on the photographs and video footages taken during the session.	☐
6. I agree to publication of photographs and videos, in which I may appear, in academic papers, presentations and online portals as well as in the PhD thesis of Ayda Majd Ardekani.	☐
7. I agree to take part in the above research project.	☐

Name of participant	Date	Signature
Name of person taking consent *(if different from lead researcher)*	Date	Signature

To be signed and dated in presence of the participant

Lead researcher	Date	Signature

Copies when completed: 1 for participant; 1 for researcher site file; 1 (original) to be kept in main file

F Stage 2 Questionnaire

Part 1: Please provide some information about yourself.

1. What is your gender identity?

☐Female ☐Other/Non-binary
☐Male ☐Prefer not to say

2. Please indicate your age group.

☐18-24 ☐45-65
☐25-34 ☐65+
☐35-44 ☐Prefer not to say

3. Please indicate the town/city of your current residence.

4. How often do you visit a heritage site?

☐Once a month ☐Every 3-6 months
☐Every 2-3 months ☐Every 6-12 months

5. Are you currently a member of English Heritage?

☐Yes ☐Not sure
☐No

Part 2: Visitor's expectation and experience

6. Please explain what you expected to encounter as part of the second study session?

7. Please compare your experience with your initial expectations of it?

8. How do you find digital creative interventions as such in a heritage context?

9. Do you think the projections have given the previous display additional informative values?

Part 3: Technology for Heritage /Visitor Engagement

10. Please explain how engaging you find the projections?

11. Can you please explain the impact of the projections on your experience of the abbey today? Was it positive or negative and why?

12. Do you prefer to see visual information in Virtual Reality or in situ (augmented reality)? Please explain why.

13. In comparison with the Virtual Reality, how favourable is the image quality of the projections?

Part 4: Views on authenticity and realism

14. Do you think your experience was authentic?

15. Please explain how you describe the projections; Real or hyperreal?

Part 5: Please rate the displays individually on the criteria below:

16. Display 1: Nave Column Base

Scale / Criteria	1- Not at all	2	3	4	5- Somewhat	6	7	8	9- Very much
Authenticity	○	○	○	○	○	○	○	○	○
Realism	○	○	○	○	○	○	○	○	○
Visual fatigue	○	○	○	○	○	○	○	○	○

Scale / Criteria	1- Poor	2	3	4	5- Moderate	6	7	8	9- Very good
Image quality	○	○	○	○	○	○	○	○	○

17. Display 2: Tiles at the Chapel of Our Lady the Angles

Scale / Criteria	1- Not at all	2	3	4	5- Somewhat	6	7	8	9- Very much
Authenticity	○	○	○	○	○	○	○	○	○
Realism	○	○	○	○	○	○	○	○	○
Visual fatigue	○	○	○	○	○	○	○	○	○

Scale / Criteria	1- Poor	2	3	4	5- Moderate	6	7	8	9- Very good
Image quality	○	○	○	○	○	○	○	○	○

18. Display 3: The Pieta Graffiti

Scale / Criteria	1- Not at all	2	3	4	5- Somewhat	6	7	8	9- Very much
Authenticity	○	○	○	○	○	○	○	○	○
Realism	○	○	○	○	○	○	○	○	○
Visual fatigue	○	○	○	○	○	○	○	○	○

Scale / Criteria	1- Poor	2	3	4	5- Moderate	6	7	8	9- Very good
Image quality	○	○	○	○	○	○	○	○	○

G English Heritage permission to conduct research at members' event

ENGLISH HERITAGE

Step into England's story

14/01/2019

To Ayda

Thank you for your interest in the member's event, The Decline and Fall of St Augustine's Abbey, on Tuesday 12th February 2019. I am writing to confirm your attendance on the day and the authorisation to conduct research and data collection during a refreshments break at the end of the tour.

The tour is a special event arranged for members of the English Heritage Trust to thank them for their continued support towards the charity, and the tour, along with exclusive access to the site during closed hours is the main focus of the day. I am happy for you to engage with the members and conduct your research and data collection as a drop in basis during the refreshments at the end of the tour.

We look forward to meeting you on the day.

Many thanks

Jocelyn

Jocelyn Crosland | Assistant Events Manager | South East
English Heritage, Dover Castle
Dover, Kent
CT16 1HU
Direct Line 01304 209 884
Mobile 07741 299 248

Dover Castle, Castle Hill, Dover, Kent, CT16 1HU
english-heritage.org.uk

H English Heritage Risk assessment

English Heritage
Risk Assessment

ENGLISH HERITAGE

Risk Assessment

Event:	Exhibition of reconstructed images (by Ayda)		Ref & version:	EH1 June 2015
Site Name:	St Augustine's Abbey	Assessed by:	Georgina Morton-Brown	Date: 11/11/19
Who is at risk:	Under 18 staff and volunteers Disabled staff and volunteers Visitors/public Staff Volunteers (including 3rd party)			
Who has been consulted as part of the planning process:	Site team, third party running the event, HHP and curators.			
Outline of the event:	An exhibition or reconstructed imageries of St Augustine's Abbey artefacts in the form of projections. The event will be held on four nights. The exhibition is part of the PhD research of Ayda Majd Ardekani for which human participants have been invited to visit and take part in the data collection process.			

Complete the relevant sections and localise appropriately

Any activity/hazard that needs a control measure must have a risk rating

Risk rating (residual risk after all actions have been taken):

Date approved:

Consequence: 1= first aid required, 3= death and life changing, 2= everything else
X
Likelihood: 1= not expected, 3= expected, 2= not a 1 or a 2

Top three risks highlighted from risk assessment

Activity/Hazards	Actions required to make hazard safe	Additional details/comments	Risk rating
Abbey Ruins	- Ensure volunteers are familiar with the site - Use flat/grass areas as a rout where possible		2x1=2
Darkness	- High vis to be worn by volunteers and 3rd party - Torches to be used along route - Visitors to be guided at all times.		1x3=3
Slip, trips and falls	- Visitors to be supervised by volunteers - Flat routes to be used where possible		2x1=2

Event risk assessment

Activity/Hazards	Actions required to make hazard safe	Additional details/comments	Risk rating
Hazard and health and safety briefings	Health and safety signage		
	H&S information provided at the booking stage by third party		

Supervision	Adequate supervision provided by EH and non EH staff/volunteers	Site team, 3rd party manager and volunteers on site at all times	
	All staff/volunteers briefed/trained and clearly visible/identifiable		
	Signage displayed where supervision is not possible and justified in risk assessment		
Site safety	Recorded inspections completed at suitable intervals	Prime checks completed by site and site managers to take care of the site during the event with	
	Log made of key decisions with times/actions recorded	regular checks	
Hazardous areas e.g. sheer drops, water features, restricted areas **Hazards include falls from heights, drowning etc..**	Suitable barriers in place (stake and tape etc)		
	Suitable lighting in place		
	Signage displayed		
Structures (Projection backdrops, sand bags and stabilisers, projector/laptop stands) built/used	Adequate emergency routs and exits provided from all areas with structures		
Emergency situations	Suitable emergency plan (including evacuation)		
	Event capacity set suitable for the event with adequate numbers of staff and volunteers in place		
	Suitable and sufficient access for sire vehicle provided		

Electricity	Portable electrical appliances have been PAT tested	Battery operated power supply	
Portable lighting	Suitable charging/inspection regime in place including time charged and area used Trailing cables avoided/managed appropriately		
Night time events	Suitable lighting installed		
	Pre-visit information provided to visitors		
	Adequate supervision provided by staff and volunteers		
Extreme weather	Suitable precautions taken and event cancelled if risk to health/monument is unacceptable		
First aid	Risk assess the first aid requirements for the event and provide adequate numbers of first aiders/first aid kits		
Lone working	See the lone working and personal safety management standard for guidance		
Manual handling	See the manual handling management standard for guidance		
Security and public order and counter terrorism	Risk as low as possible, staff to remain vigilant	n/a small event	
Crowds gathering	An assessment of crowd management arrangements is carried out including capacity and evacuation procedures	Not to exceed the site capacity	
	Crowds to be supervised by volunteers		

Communication	Staff and 3rd party to carry mobile phone	All staff to have each other's numbers	
	Emergency contact numbers shared amongst management team		
Vulnerable people	Age limit specified and communicated to visitors (under 16s must be accompanied)		
	Lost child procedure in place and staff briefed	Regular site procedure in place	
	Disabled access and information considered.	Regular disabled access to the site	

Third party manager:	A. Majd Ardekani
Site manager:	G. Morton-Brown

The third party manager and site manager must sign this risk assessment prior to the event taking place

Signing confirms that you are satisfied with the control measures and that you understand your roles and responsibilities for the event

Date approved:

EDA RISK ASSESSMENT FORM

University of Kent

Department/Section: EDA

Date of Assessment: 11 November 2019

Assessor: Ayda Majd Ardekani

Authorised Signature: Dr Rocio von Jungenfeld (PhD supervisor) – digitally signed

Risk Matrix

LIKELIHOOD	CONSEQUENCE: Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Almost Certain 5	5	10	15	20	25
Likely 4	4	8	12	16	20
Possible 3	3	6	9	12	15
Unlikely 2	2	4	6	8	10
Rare 1	1	2	3	4	5

Description of Activity (Give detail):

Exhibition event at St Augustine's Abbey as part of PhD research experiment on evaluation of visitors' experiences. The site has been specifically booked on the dates below for the participants of the experiment to visit the exhibition.

Event dates:
Wednesday, 20th of November
Monday, 25th of November
Saturday, 30th of November and
1st of December of 2019.

Activity Location: St Augustine's Abbey, Canterbury, CT1 1PF

Risk rating key – Also see risk matrix:
L = Likelihood of hazard happening, Rating of 1 to 5
C = Consequence of hazard happening, Rating of 1 to 5
R = Risk (Likelihood x Consequence = Risk)

Description of hazard and hazardous event (List)	**PERSONS AT RISK AND HOW** (Consider all persons, including those who may not be involved with the job)	**What Risk controls are currently in place**	**Current risk rating***	**Are further controls needed, if so what are they**	**Residual risk rating after further controls***

			L	C	R		L	C	R
General *Event takes place during dark hours.*	*Visitors of the abbey site and event organisers.*	*All event guiders are familiarised with site and walking pathways and will be wearing high vis clothing.* *All visitor will be accompanied by at least one event guide during their visit and remain in the designated walking paths.* *Head and handheld torches will be provided to event guides.* *All event guides have access to mobile phones and contact details of researcher (Ayda Majd Ardekani) and the site Manager.* *A register of participants will be taken upon their arrival.*	*3* *4*	*3* *3*	*9* *12*	*All visitors will be accompanied by at least one event guide during their visit.*	*2* *2*	*1* *1*	*2* *2*
Display 1: Projector backdrop fall	*Visitors of the abbey site and event organisers.*					*Perimeter of the display is identified.*			

		Visitors and guides will be health and safety briefed on arrival. *Equipment stabilised with sandbags* *Visitors and event guides are not to enter a specified area nearby the equipment.*							
Display 2: Slip hazard by the steps in wet and low light conditions ***Display 3:*** Projector backdrop fall	*Visitors of the abbey site and event organisers.* *Visitors of the abbey site and event organisers.*	All visitors and guiders have been informed that event takes place outdoors and should wear appropriate footwear. *Equipment stabilised with sandbag and installed out of visitors walking pathway.*	3 3	3 2	9 6	The guides will illuminate the path with torches and warn the visitors if need be.	1 1	3 2	3 2

<u>NOTE</u>: Before conducting any activity all those involved must have read and understood the risk assessment document and ensure controls measures are being implemented.